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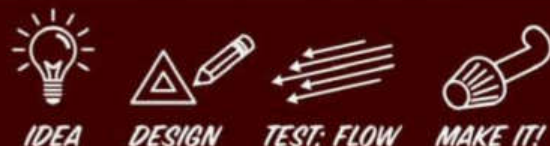
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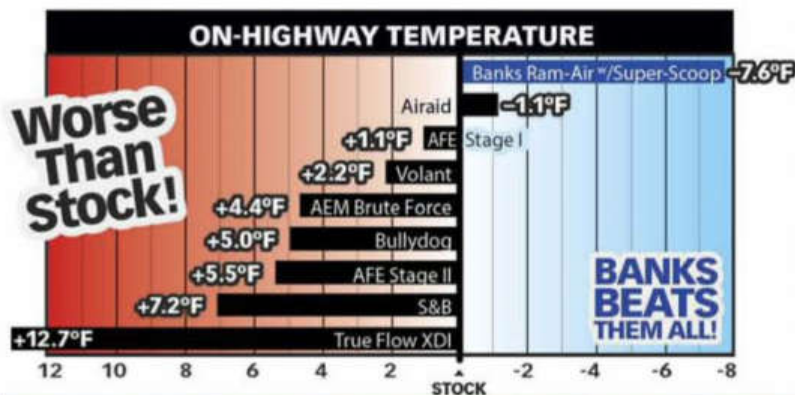


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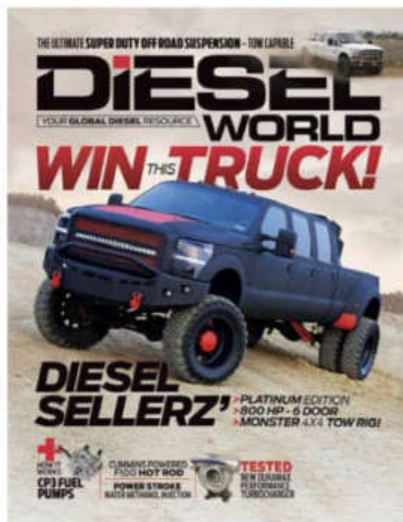
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EDITORIAL

Adam Blattenberg Editor
Trent Riddle Technical Editor
Anthony Orona Managing Editor
Henry Z. De Kuyper Senior Staff Photographer

DESIGN

Ronald Abella Art Director
Eric Knagg Design Director

CONTRIBUTORS

Kyle Tobin, Jim Allen, Jim Bigley, Jason Sands, Bill Senefsky,
Chris Tobin, Jacob White, Mike McGlothlin, Jade Tobin, Mike Alexander

ADVERTISING

Bob Hulsey Publisher Automotive Group
Gabe Frimmel Ad Sales Director

(714) 200-1930
GFrimmel@EngagedMediaInc.com

Tom "Mongoose" McEwen Motorsports Director
(714) 200-1936

Chris Crispell Account Executive
(714) 200-1935

Andrew Demiar Account Executive
(714) 200-1903

John Cabral Advertising Design
Eric Gomez Advertising Traffic Coordinator

DIRECT MARKETING GROUP

John Bartulin (866) 866-5146 ext. 2746

OPERATIONS

Subroto Mallick Business Analytic Manager
Robert Short IT Manager

Harsh Srivastava Newsstand and Circulation Analyst

Shailesh Khandelwal Subscriptions Manager

Alex Mendoza Administrative Assistant

Jeno Torres Administrative Assistant

Victoria Van Vleer Intern Program Manager
Arvind Sidhu Prepress Manager

EDITORIAL, PRODUCTION & SALES OFFICE

22840 Savi Ranch Parkway, #200, Yorba Linda, CA 92887
(714) 939-9991 • Fax: (800) 249-7761
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Nick Singh President
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Gus Alonzo Circulation/Marketing Director
Jason Mulroney Director of Content
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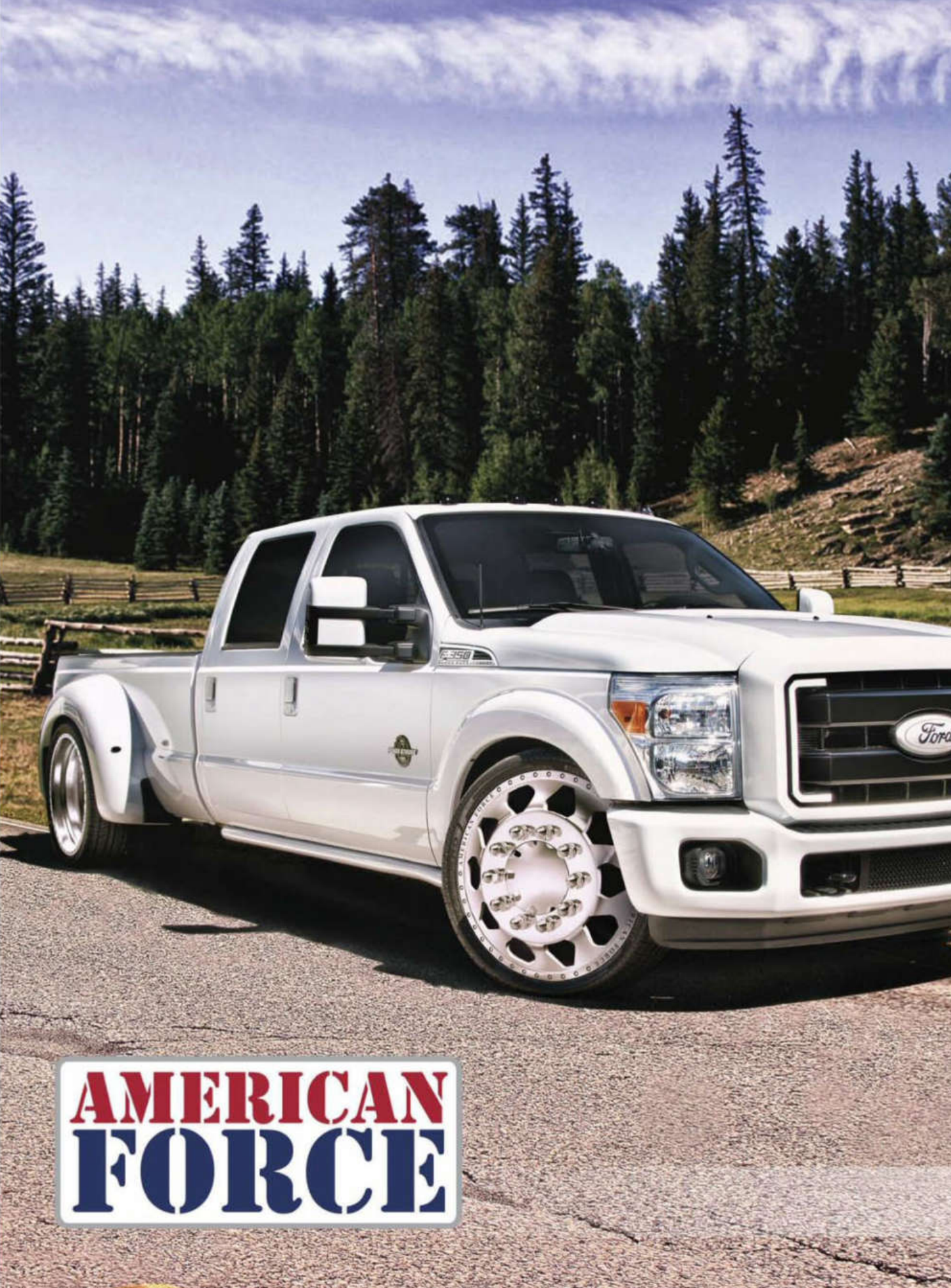
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Ticket to Ride

Diesel World Takes You Back Stage

BY ADAM BLATTENBERG

Show season each year is an exciting and extremely busy time for diesel enthusiasts. Just about every weekend, for 3-4 months straight, I'm on the road.

Heck, I'm writing this from 38,000 feet aboard a Boeing 737 on my way home from the wildest event of the year: Scheid's Diesel Extravaganza (complete coverage from that event will be in our next issue, or you can check it out on DieselWorldMag.com right now). If you've never been, you need to go: An estimated 15,000 trucks rolled through the gates to watch and compete in sled pulls, drag racing, dyno competitions and massive show and shines at the Wabash Valley Fairgrounds in Terre Haute, Indiana. It's a bucket list event for any diesel enthusiast; that's for sure.

Oddly enough, however, shortly after I step off the plane and return to Diesel World's headquarters in sunny California, I'll be packing my bags again for Alligator Performance's "Hunting for Horsepower" event in Spokane, WA - after that - the NHRDA finals in Ennis, TX, and then to the most massive automotive aftermarket event in the world: the SEMA Show. Luring around 120,000 attendees from around the globe to the 3.2 million square foot convention center in Las Vegas, it's another spectacle you'll have to witness at least once in your life. Unfortunately, SEMA's an industry-only event, which means it's closed to the public. So, unless you're harboring plans to break into the diesel industry anytime soon (a dream we completely back) the goodies inside SEMA will be off-limits to you. But, don't worry. We'll be there, and by the time you pick up this issue, we'll have covered the show inside and out: All of the baddest diesel trucks, cars, industry news and tech advice will be laid out on DieselWorldMag.com.



NHRDA's Randy Cole grabbing a VIP full pull pic.

If you only care for swiping through photos, we'll have the sickest shots on Instagram @DieselWorldMag (or on FaceBook "Diesel World Magazine"). In other words, you'll have SEMA at your fingertips.

Because attending shows, races and events is the best way to become part of the diesel scene. It doesn't matter if you're not a big racer, if all you want is more MPG, that knowledge can be found at events; if all you need is a bit more power for towing, tips can be picked up at events; if you just want a great looking diesel truck, inspiration can be found at events. While we all have slightly different preferences, at the end of the day, we're all just a bunch of diesel junkies, and we

THE WAY WE SEE IT... IS THAT DIESEL WORLD IS YOUR TICKET TO ANYWHERE IN THE COUNTRY, ANYWHERE ANYTHING BADASS IS HAPPENING.

can learn from each other. The amount of bench racing done at these events is massive. Take advantage of that and go to as many as you can.

If you can't make it, it's ok: The way we see it... Diesel World is your ticket to anywhere in the country, anywhere anything badass is happening. 'Cause everywhere we go: You go. It's as simple as that. And as much as I'm looking forward to getting a break in the winter months from this hectic show season (and catching up on my own diesel projects) it's been worth the madness knowing I'm not the only one who lives for this. **DW**

-Adam Blattenberg

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Colorado Diesel Is Official

GM has officially announced the introduction of a diesel Colorado for the 2016 model year. The Chevy Colorado will be offered with a 2.8L Duramax I4 engine, which will deliver 369 lb-ft of torque, 100 lb-ft more than the current 3.6L V6 gas engine. The Colorado's towing capacity on 2WD models is 7,700 lbs.



VOLKSWAGEN CHATTANOOGA BUILDS 500,000th PASSAT

The Chattanooga Tennessee Volkswagen plant has hit a milestone with half a million Passats rolling off the assembly line. This midsize sedan has a reputation for being reliable and frugal on fuel, especially when equipped with the optional diesel engine.

With an EPA rating of 33/44 for the 2.0L diesel with a 6-speed manual, this car has a range of 814 miles. That's a long haul on just the 18.5 gallons of diesel the Passat carries.



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NEW FORD F-650/750s Roll Off The Line

All-new Ford F-650/F-750 medium-duty trucks rolled off the line for the first time in United States this August. Production of the trucks at the Ohio Assembly Plant (which were previously built in Mexico) helps secure more than 1,000 hourly UAW jobs and a \$168 million plant investment in the United States.

The 2016 Ford F-650/F-750 trucks, available now, can deliver commercial-grade quality capability and convenience and feature segment-exclusive Ford diesel engines, delivering strong performance at an affordable price.



Audi Announces New Look and Features for 2015 A6 and A7

The Audi A6 and A7 is offered with a wide range of engines, and one of them is a diesel. For 2016, the A6 and A7 receive new front and rear designs for a more dynamic stance and greater presence on the road. A vibrant new front fascia includes new LED headlight designs for an unmistakable light signature on widened, single frame grille and bumpers for a more focused stance. The rear of each vehicle features LED taillights and new trapezoidal tailpipes integrated into the lower bumper.

The TDI models are offered in the Premium Plus (mid level) and Prestige (top level) trim lines only. They both include the Quattro drive and Tip-tronic automatic in the package. The 3.0L TDI V6 is rated at 240 hp and 428 lb.-ft. EPA mileage rating is 25/38 for both vehicle options. **DW**



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Brockway

An American Specialty Original

TEXT BY **BILL SENEFSKY**

The saga of American Brockway trucks was born with Brockway Carriage Works in 1875. William N. Brockway founded the firm in Homer, New York, which at the time was a community of numerous cottage industries. The family firm thrived, and in 1889, Brockway's son George was brought into the organization. G. A. as he was known, was a quick study, with both a keen eye on the production end, as well as changing market trends. The carriage and wagon industry, which was then profitable, would see drastic changes in the transportation field: Self-propelled platforms were the future, and the younger Brockway instinctively knew that horse-drawn platforms were on the wane. The W.N. Brockway Carriage Works cautiously developed and assembled 30 mechanized units dubbed the "Auto-delivery wagon" along side of the regular production line. Though many in the firm were skeptical and labeled these platforms as experimental in nature, Brockway had already embarked quietly on his future business plan. An association with Chase Motor Truck (CMT) of Syracuse, New York, then a well-known producer of motorized delivery platforms, was developed.

DEVELOPMENT

A three-cylinder, two-cycle, air-cooled front mounted unit producing fifteen horsepower powered the Brockway produced units. In appearance, they differed little from CMT production platforms, as Brockway had become the Corporate Manager of Chase, as well as gaining a seat on its board of directors. Brockway's firm now entered the branded automotive parts business and produced three body options, including: a duck

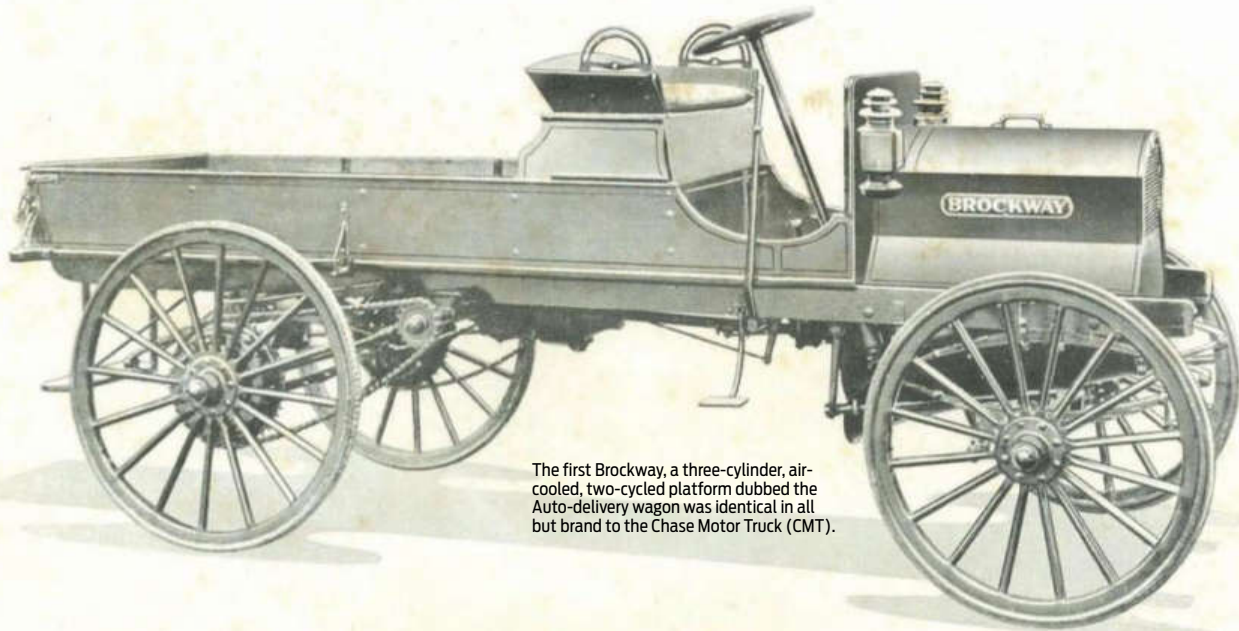
top semi-enclosed cab, a one-piece enclosed panel bodied delivery and the shared open seated "Auto-wagon." Brockway's successful business plan continued as Chase Motor Truck and became Brockway Motor Truck in 1912.

The new firm moved its operations and was incorporated in Cortland, New York, with initial capital of \$100,000.00. All of its shareholders were now Brockway family members. The newly located firm would produce

95 platforms during 1912 and 1913, all of them being Brockway Model-Ts.

EXPANSION

The '20s found the American auto industry experiencing both explosive growth in terms of brand choice and optimistic profitability. As a result, the purchase of related businesses began in earnest. In February of 1928, Brockway purchased the assets of Indiana Truck. The business plan was simple: broaden the company's offerings by



The first Brockway, a three-cylinder, air-cooled, two-cycled platform dubbed the Auto-delivery wagon was identical in all but brand to the Chase Motor Truck (CMT).



Brockway's Metropolitan Cab featuring a unit moved forward on the chassis with no increase in cab height: a popular option in the late '30s.

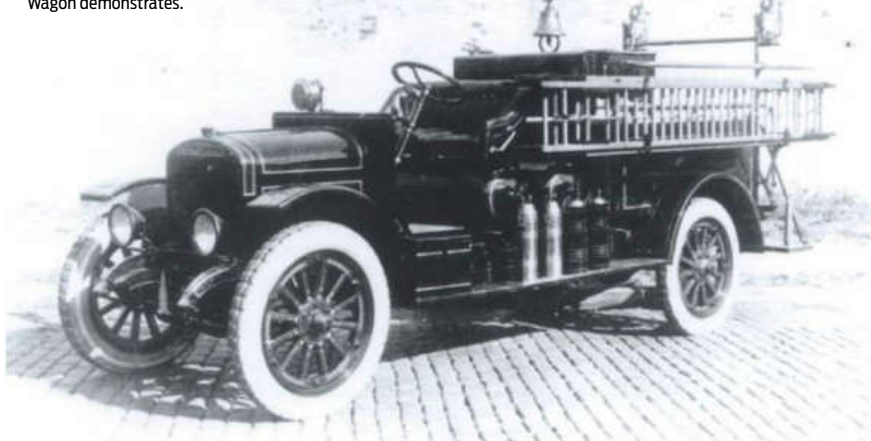
producing a wider range of load capacity with increased GVW. Production output was increased with plants in Cortland, NY, and Marion, Indiana. The combined firms' assets were now exceeding \$9,000,000.00, with sales over \$15,000,000.00. The Brockway-branded vehicles would eventually replace the Indiana mark although some Indiana platforms remained in the present line for the time being.

TRAGEDY STRIKES

1929 saw the company engaged in its brand and consolidation of offerings with the Brockway and Indiana labels. With continued sales success, the firm had increased its cash flow, had money in the bank and a future ripe with opportunities. The Autocar brand from Ardmore, Pennsylvania, became Brockway's next target. Negotiations were quietly established behind the scenes with Brockway seniors and Autocar executives. In addition, Brockway associates began a stock purchase. Large blocks of Autocar stock were on hand when the crash occurred in October of 1929. Overnight, management interactions and further stock purchases ceased. With regard to Brockway, its president was also caught in a massive stock manipulation scheme, personally attempting to regulate Brockway's stock price for personal gain. Company president Martin O'Mara was indicted on charges and brought before the New York Supreme Court. With its brand value falling like a rock, the company was immediately forced to drop its merger plans, abandon its president, and sell the Indiana brand and its facilities to Cleveland based White Motors in early 1932.

If this weren't enough, Brockway was

Brockway chassis were highly respected and utilized in the motorization of American fire agencies, as this 1912 Chemical Wagon demonstrates.



The platforms got larger as the loads and customer needs increased. This 1930 pumper is a fine period example.



Trucks became more aerodynamic in styling as well as this 1938 Brockway medium-duty chassis demonstrates.

forced into reorganization the same year under the National Bankruptcy Act, Section 77B. On a play of words, Brockway Motors replaced the original Brockway Motor Truck Corporation. The firm was fortunate to survive with no interruptions to company production, sales or service. Tragically, during this depression period, more than 300 automotive brands left the American road.

1933 found the firm advancing once again in the marketplace, with the introduction of the new Brockway V-1200, a heavy-duty conventional tractor platform powered by American-LaFrance's famous V12 gasoline engine producing 240 horsepower. This new platform was claimed to be the largest of this time period. The new Brockway line offered 21 models with an additional 11 electrically powered. The Electric Truck Division was located in the city of New York.

Eleven new truck platforms were offered for 1935. New styling cues were launched which would remain apparent through the '50s.

November 1937 saw another company reorganization plan presented to the Federal Court in Syracuse by the company's preferred stockholders. A new board was also elected, with debts and obligations eliminated.

WAR CLOUDS, AGAIN

In the late '30s, war clouds once again appeared in Europe and the Far East. By 1939, the industry was looking for a true cabover engine designed chassis. Brockway introduced its new Metropolitan Cab. Though many referred to it as a cabover unit, in fact, its novel design moved the cab forward on the chassis to gain more space but not raise the cab height. A crew cab version was designed and later offered to allow four to five additional passenger capacities. Though other competitive brands were experimenting with diesel power in the truck market, Brockway remained true to its gasoline-powered platforms.

The Army, impressed with Brockway's

heavier platform capacity, approached the firm to produce a 6x6 for the Corp of Engineers to haul general materials and pontoons for the construction of temporary combat bridges. The result was the C-666, which first saw production in early 1942. The platform was also utilized for fire fighting and heavy crane operations. A new 260 tractor was also offered to the civilian market in 1945. A sleeper cab version was available a year later.

With the beginning of the Korean Conflict, Brockway continued to supply its widely respected heavy-duty truck platforms to the military.

POSTWAR RECOVERY AND ISSUES

1946 saw the company returning to civilian production with the firm claiming delivery of 4, 212 units. Sadly, within the following twenty-four months, a solid quarter of that number was lost. As the recession deepened, the independent truck makers again looked to mergers to help solve their overcapacity problems.

Brockway introduced 20 new platforms into the marketplace, continuing with established Continental gasoline units along with Fuller supplied transmissions and Timken axles.

The '50s saw the buyout king, White Motor of Cleveland, purchasing truck brands at a record pace: Sterling Motors went in '51, Autocar in '53 and Reo in '57 followed by Diamond T in '58. Sagging production numbers, overhead and lack of profits continued to dog the industry.

November of 1954 found Brockway agreeing to an offer by the H&B Machine Company that would lease the firm for a five year period with an option to buy. A one-month deadline was specified, after which, if H&B couldn't raise the capital, the agreement ceased. Brockway management remained in place during this time period and continued uninterrupted when H&B failed to meet the terms.

Brockway management finally added diesel powerplants to its line-up in 1955. Continental, a company mainstay, provided the diesel units. Brockway also added the UAW to its rank and file in the spring. Brockway continued its independ-

May 3, 1930

THE SATURDAY EVENING POST

BROCKWAY-INDIANA TRUCKS



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THE Petroleum Industry, in field operation and delivery service, is one of the world's most grueling truck-testing grounds. Food, shelter, dericks and machinery go barging across fields, through swamps and up mountain grades in motor trucks whose drivers frequently have to disregard capacity ratings to do the job. In delivery service these mobile "pipe lines" must be designed to keep a jump ahead of the insatiable thirst of a fifty-mile area. 2000 to 2500 gallons of gasoline or oil at a clip — often with a similarly loaded trailer tagging behind.

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POWER MATCHED TO INDUSTRY

The brief merger of Brockway and Indiana brands, sadly ended by the Great Depression, was the company's first attempt at market expansion.

ence but suitors were lining up at the gates. White Motor began discussions early in the year but terminated the following July. Continental, Brockway's long-term supplier, began talks but walked in August.

ENTER THE BULLDOG

Long term established truck manufacturer Mack of Allentown, Pennsylvania, was also caught up in the market issues and concerns. Looking for both financial improvement and increased capital, it looked to maintain its operations and expand

profitable market share as the market contined shrinking. As a result, in April of 1954, the financial firm Northeast Capital, purchased large blocks of Mack stock resulting with the addition of four new members to Mack's board of directors.

Northeast saw the value of keeping Mack's heritage, independence and solvency in place and evidently agreed with its expansion plans. To that end, Mack entered into an agreement of a lease/purchase deal for Brockway in August of 1956. Initially, the first \$3 million transferred was

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only for Brockway's inventory. A four-year lease was also drawn up, allowing Mack more time and cash flow to complete the deal. The purchase of Brockway would increase Mack's production efforts it was believed. It was also agreed that Brockway would operate as a separate division retaining its identity, with its established organization in place and maintaining its traditional and successful build to order policy with its reduced operating costs.

THE HUSKIE

Brockway entered 1957 on a roll. A massive advertising campaign along with a new corporate mascot appeared. The Mack board of directors felt that Brockway trucks needed a mascot as tough as Mack. The result was the Huskie, which appeared on production output beginning in 1958. The UAW also struck the same year closing all six factories until December. Mack made good on its purchase of Brockway's Cortland plant and branch facilities for \$12,000,000 in January 1959. May 15, 1959 saw the launch of the first Huskie mascots on Brockway trucks.

THE 50TH

The company continued its marketing efforts for the new decade with a bit of fanfare surrounding its 50th anniversary in 1962. Government contracts again were signed with the military, with a one million dollar order for heavy-duty trucks.

Product wise, component sharing was notably increased between the two brands. A modified Mack F-Series cab, with a true cab-over-engine (COE) configuration was added in 1963. Brockway's 300-Series was launched to meet the now-government mandated 90-inch bumper to back-of-cab (BBC) requirement. Increased trailer lengths were the supposed reason. In any case, the 358 and 359 helped to increase Brockway sales by 25% for 1966, an industry best at the time.

White again approached Brockway for a merger in March 1967 and was rebuffed.

The Mack and Brockway duo continued to be a mixed bag as far as industry observers were concerned. Though production and component sharing helped,



The 761 Series, the front one piece cowl, grille and nameplates are Brockway: The cab is definitely Mack.



Brockway 759 Series. The influence and body sharing of Mack components is graphically obvious here.

Brockway's successes were being impacted by Mack's continual stream of cash flow problems.

Signal Oil and Gas purchased the combined concern on August 18, 1967. Conglomerates were a trend with diversification being the object. Though the new owner brought increased capital and continued brand independence, serious issues remained in the heavy-truck market.

Brockway soldered on, introducing several conventional platforms in 1967. The 300 Series added a new 360 with a set forward front-axle, and the 361 with a set-back front axle feature. Both units shared features and structural components from the 300 lineup.

"Huskiedrive" was launched a year later, a Mack carry-over, featuring a high-torque diesel engine combined with a five-speed transmission along with the two-speed rear axle.

The system utilized a dash-mounted switch, which allowed the driver to start in Power mode and then switch to cruise position after manually shifting through five gears.

The addition of Caterpillar diesel engines was a noted plus to Brockway's option sheet in 1970. This same year, Brockway led the industry in sales.

In May of 1971, the low profile, cab-forward 527 "Huskiteer" platform was introduced and directed for confined operational areas and metropolitan cities.

THE END

The end game began in 1973 with the energy crisis affecting the trucking industry.



A Brockway tractor from the '50s. The continued '30s styling is noted here.

In addition, the Federally mandated Department of Transportation brake standard MVSS121 of March 1, 1975 specified highly sophisticated automatic anti-skid braking systems to be installed on all new Class-8 trucks. An industry wide shortage of these brake system components along with an industry wide economic recession doomed the last of the independent truck builders, including Brockway. This regulation, which added to a massive economic recession and a tight money supply was an industry death knoll. Severe parts shortages from outside suppliers added to the demise. Though the orders were placed, production was slowed and eventually ceased.

In Brockway's case, labor problems surfaced in the summer of 1977. Union employees had been working without contracts for months. Friction developed between labor and management with regard to representation. Relations between Brockway and Mack became strained over a couple of government contracts, and a wildcat strike occurred and shut the Cortland production facility down. As a result, Mack closed the Cortland facility; thus eliminating the historic Brockway brand forever. **DW**

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It's common to find that the stock bellhousing on 1994-03 Dodge/Ram diesel trucks can be cracked. Just finding your engine and transmission package for your swap was time consuming, and you still may not have all the parts required. Worse, NOS (new old stock) units are hard to find now that the factory has discontinued them.



The solution for your Cummins swap is one of Advance Adapters' reproductions of this now discontinued bellhousing. Perfect for doing an engine conversion, converting a Gen II truck to a manual, or just replacing a broken factory bell in your existing truck. Two part numbers are available, and one is a complete kit, including pivot ball, release arm and retaining clip. Also available as a blank casting only.

P/Ns 712586, seen here, and 712586A

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The light bar has 120 surface-mounted LEDs that put out 1,250 lumens. Eastwood claims that this is up to two times brighter than conventional LED work lights. The light folds in half for easy storage. The kit includes an AC/DC adapter and 12V charger for the 7.4v 2200 mAh Li-ion battery.

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M-1 Sliders come with a matte black textured powder coat finish and 1/8-inch thick steel CNC cut and dimpled plates for sure-footed ingress and egress. Smittybilt M-1 Sliders come with all the necessary hardware and bolt on with simple hand tools.

Seen here is an M1 Slider on a Super Duty Ford.

Smittybilt
310.762.9944
Smittybilt.com



Diesel Harness Wiring Services

Late model Ford Cummins conversions require a lot of time spent with wire cutters and a great deal of confidence interpreting a wiring schematic. If dealing with a snarl of wires is the only thing holding you back from a conversion, ship your wiring harness to Diesel Conversion Specialist and have them modify it for you.

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BD'S NEW Throttle Sensitivity Booster has five performance settings, including a ludicrous and valet mode. BD's TSB accesses your engine's full power potential...with just a touch of the accelerator pedal. Easy to plug in with factory connections; no tampering with emission controls. It's 50-states legal, and the new compact enclosure on its own contains a sliding switch with 2 levels of performance. Dodge/Chrysler, Ford/Lincoln, Chevrolet/GMC and Jeep applications for pick-ups, SUVs, cars and vans.

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The design allows correct A-Arm angle and doesn't over extend the throw of the ball joint, eliminating premature ball joint failure. Unlike some companies who use a 2.5-inch coil spacer, MaxTrac splits the difference with the coil spacer and strut spacer to keep the strut from topping out. Spacers are finished in a signature gray, high-quality powder coat for durability and rust prevention.

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MaxTracSuspension.com

LED Brake Light Receiver Hitch Cover



Covering your receiver hitch opening keeps dirt out of your hitch box. Now you can add a third brake light at eye level for those little cars on the road.

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Cummins Swap Intercooler Kits

When you've got your new diesel swap engine in place, wired and nearly ready to go, it's time to consider the intake plumbing. The last details include having tubes bent for the intercooler. Save the money on custom tube bending and order a pre-made set from Diesel Conversion Specialist. Intercooler tubing kits are complete with tubing, silicone boots and clamps, and are available for Cummins conversions in Ford trucks from the early '90s through 2008. The '08 to current kits are under construction.

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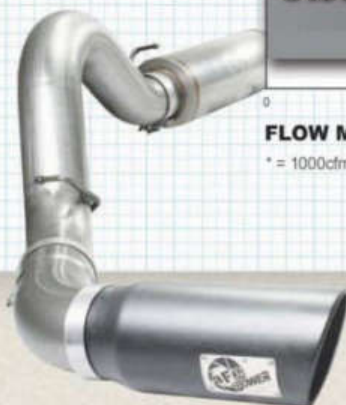
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TEXT AND PHOTOS BY JASON SANDS



There aren't many trucks that are universally liked by everyone, but this one fits the bill. Brig Pannepacker's '04 Ford is not only a stylish Harley Edition, it mixes the best parts that the "big three" have to offer, with a Cummins engine and Allison 1000 transmission shoved into the sturdy Ford frame. The drivetrain has also been extensively modified, and the truck has put down a dyno-proven 770 horsepower to the rear tires in towing mode and crested 1,000 hp in an all-out race tune.



The 6.7L Cummins is a definite upgrade from the factory 6.0L Power Stroke diesel. Capable of more than 1,000 horsepower, the engine is turned down to 770 hp for regular street use. The conversion over to the Cummins was performed at Destroyed and retains much of the factory heat, air conditioning, and cooling systems.



HOT ROD HARLEY

BRAVE HEART

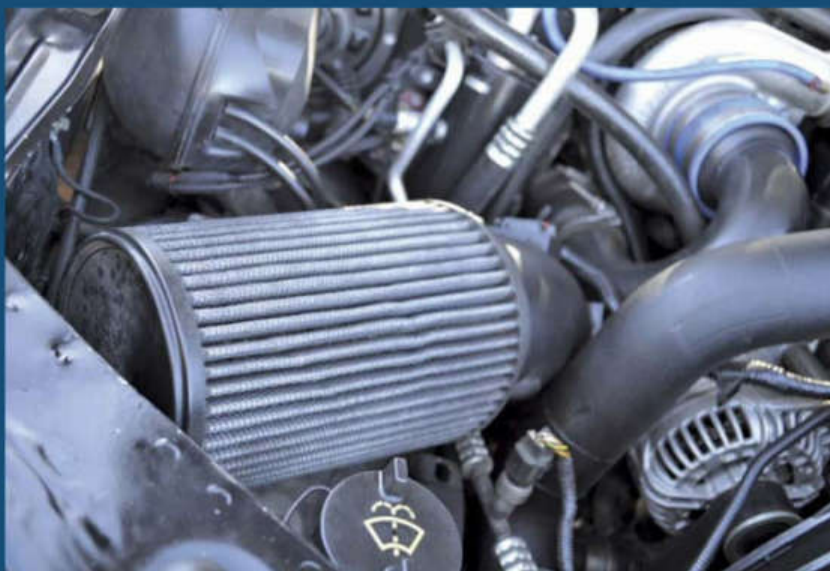
When he first acquired the truck, Brig knew he didn't trust the 6.0L power plant that it came with, so it was immediately yanked. The new Cummins engine that now resides in the engine bay is also a displacement bump as compared to the old engine, at 6.7L. Built with the help of the crew at Destroked, the inline-six has a number of internal upgrades, including connecting rods from Woodruff Diesel, coated pistons, ARP 625 head studs, and a Colt Big Stick camshaft. The head has also been O-ringed to help keep the engine's cylinder pressure in the cylinder, where it should be.

TURBO CHARGED

Since Brig lives fairly high up in elevation, the reliability and drivability of compound turbochargers won out over the simplicity of a single turbo. The smaller of the two turbos is a 64mm S300 from Engineered Diesel, while the bigger of the two is a 75mm S400 that has a 90-degree cover



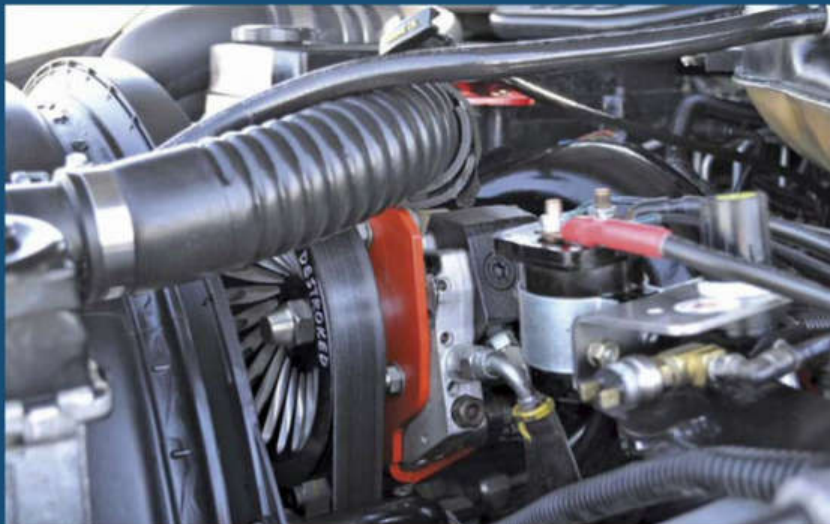
The oversize 20-inch XD Series Rockstar wheels match the Harley's paint and stance perfectly, while 35x12.50R20 Toyo Open Country A/Ts provide a smooth ride. The custom remote-reservoir shocks are from King and part of a 4-link 4-inch lift conversion kit from Full Traction.



The enormous AFE air filter is the first thing that most people spot when they see the engine, which feeds air to a 75mm S400 turbocharger that has been modified by Destroked.



After the air is initially compressed by the big turbo, it is then fed through a 64mm turbocharger built by Engineered Diesel, which sends a whopping 70 psi of boost through a Banks Power Stroke intercooler and into the engine.



More than 1,200 hp worth of fuel is on tap thanks to a twin CP3 kit from ATS, with a custom pulley from Destroked. The very large 300-hp injectors from Industrial Injection are kept in check with a Zeus ECM, which allows a perfect match between the fuel and air curves of the engine.

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The Allison 1000 transmission that handles the 6.7L's estimated 1,800 lb-ft of torque was built by Scott Countryman at Destroked and adapted to the Cummins engine with one of the company's adapters. The rest of the Ford's driveline remains unchanged, thanks to an adapter to the factory 273 transfer case.



The rear suspension has been extensively upgraded to handle the massive loads that Brig often has in tow. A set of progressive rate springs from Deaver lift the truck slightly to match the front, while Bilstein shocks and Firestone airbags help with support under load.

from Destroked. Together, both chargers push an impressive 70 pounds of boost through a Banks intercooler and into the engine. The engine's injection system has also been heavily modified for performance. Twin CP3 pumps now keep rail pres-

sure up and feed massive injectors from Industrial Injection, which are rated at 300 hp more than stock. The final touch was a water-methanol injection kit from Snow Performance, which helps control EGT when towing heavy loads.

Backing the well-engineered Cummins combination is an equally built Allison 1,000 six-speed transmission. Built by Destroked, the Allison has added clutches, a revised valve body, and a triple-disc converter from Precision Industries. Destroked



Since Brig occasionally goes off-road (although you'd never know it by the condition of the truck) a large LED light bar from Rigid Industries, a Fab Fours bumper and Warn winch keep the truck out of trouble.

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provided the adapters for the transmission-to-engine and transfer case connections.

DREAM TEAM

After the basic Cummins/Allison combination was figured out, there was still a matter of controlling both the engine and transmission. Here Brig went a path less travelled and installed a complete stand-alone Zeus ECM with the help of Destroyed owner Scott Countryman. Nearly infinitely adjustable, the Zeus can be programmed with custom fueling, timing, and rpm limits to give full control over the Cummins engine. In addition to the Zeus, a stand-alone Allison controller from Destroyed was also added, which allows the use of such niceties like tow-haul mode, a tap shifter, and EFiLive for tuning.

With such a nice powertrain, Brig wasn't about to let the rest of the truck stay stock. With help from his buddies Chris Wilson, Mark Buehrle,



The interior of Brig's Harley truck is one of the nicest we've ever ridden in, and it hides a number of features that Brig integrated himself with the help of buddies from All Fab Inc.



The back seats in the Harley are just as comfortable as the front and even have their own center console.



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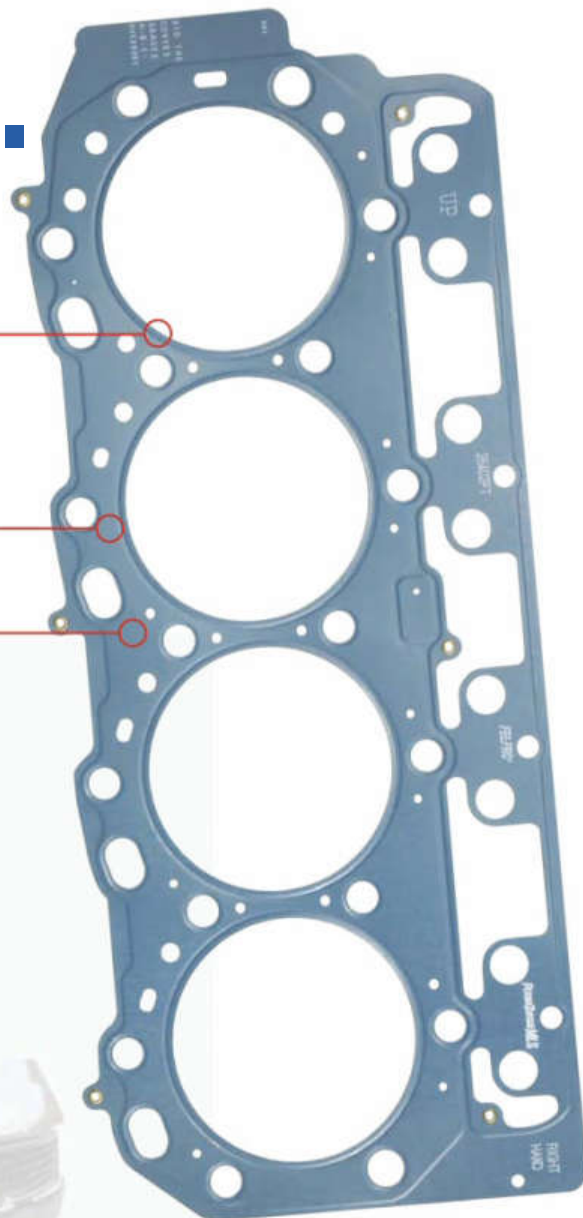
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The rest of the interior also has a number of niceties that Brig incorporated into the build. The center console for instance, has this cool I-Pad holder so Brig can watch movies while he's towing (we're kidding).



The rear of the truck was modified with a functional and understated rear bumper from Fab Fours.



In the bed, a gooseneck hitch hints at the capability of Brig's Harley. The toolbox has even been modified with the installation of an internal water-methanol tank that helps the Harley keep its speed up when pulling long grades.

and Josh Pannepacker, Brig and his crew started on modifying the Ford's suspension and interior. The front of the truck was upgraded with a 4-inch 4-link conversion from Full Traction with King coil-over shocks. The steering also received assistance in the form of a hydraulic assist from PSC. Out back, Firestone airbags, Bilstein shocks, and custom-arched Deaver pro-

gressive springs give the rear of the truck a lift and extra support.

BRIG'S BIG RIG

With a reliable and fully tunable powertrain, and extremely capable chassis, Brig now finally had the Ford that he'd always wanted. After making a number of both exterior and interior upgrades, the

'04 has looks that are hard to beat and a cabin that's extremely comfortable on road trips. Brig reported that he's grossed more than 30,000 pounds with his Harley, so nobody can question the truck's capability. We even got a chance to drive the killer Ford, and as we patrolled the area, we honestly couldn't think of a better combination of looks power, and durability in a big rig. **DW**



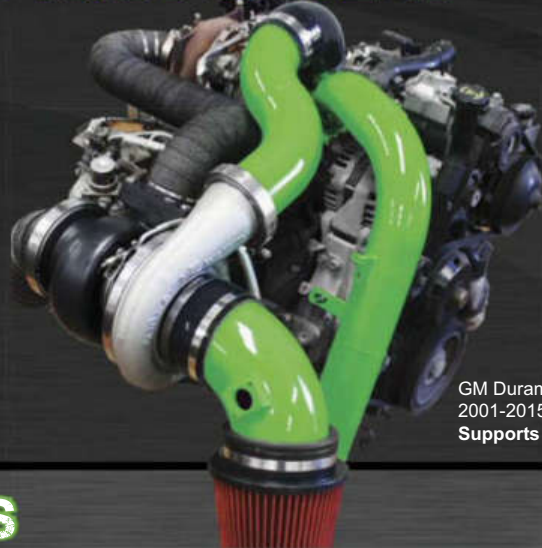
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Uncommon-Rail Injection

Look Behind Closed Doors, at S&S Diesel Motorsports

TEXT BY CHRIS TOBIN
PHOTOS BY CHRIS TOBIN
AND COURTESY OF S&S DIESEL MOTORSPORTS

We had the chance to visit two of the S&S Diesel Motorsports sites in Michigan to see some common-rail injectors and pump magic for ourselves. At the northern Michigan facility, we were able to see some of the intricate microscopic work that goes into making injector nozzles deliver additional fuel with the EDM (Electrical Discharge Machining) process. Then we spent a day at Hudsonville, Michigan, to go over the nozzle honing, pump building and overall testing capabilities they have in house. While there are several techniques and methods that are proprietary, Greg Spoolstra walked us through the basics so that we could share what we learned with our readers.



Kyle Michael relies on S&S Diesel Motorsport fuel injectors driven by a quartet of Bosch CP3s to make tons of power with his common-rail Duramax-powered Super Stock Class pulling truck.

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INJECTOR BUILDING

Starting with new complete injectors from top OEM manufacturers, Bosch and Siemens, the bodies are given proprietary internal treatments to optimize fuel flow and have control through the body into the nozzle. Injector nozzles feature a series of very small diameter holes that are specifically angled to form a spray pat-

tern of fuel into the fuel bowl of the piston for combustion. To increase the flow through the nozzle, the S&S team uses the EDM process to precisely enlarge the holes in the nozzle using a high-voltage electrical current and an ultra-fine electrode. After the EDM process, both the inside and outside of the nozzles are inspected under magnification through the close-up lenses of a



1 Linda Geiger operates the EDM equipment used to enlarge the openings in the injector nozzles in a precise and controlled method. Notice the small injector nozzle at the tip of the arrow compared to the size of the machining equipment.



2 While the EDM operation is underway, dielectric liquid flows across the nozzle tip making the "spark" or actual removal of material from the nozzle barely visible.



3 With the fluid flow shut off, you can see the sparks as material is removed from the nozzle.



4 Ruth McLachlan inspects the inside of a nozzle with a borescope after the EDM machining is complete to make sure that the holes were properly cut.



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5 Ruth also inspects the outside of the nozzle tip under a microscope to make sure that there are no problems with the machining.

bore-scope and microscope to make sure the passages are accurately cut through the nozzle.

Just enlarging the holes in the nozzles is not enough for the crew at S&S—once the nozzles are EDM'd, they are honed under several tons of hydraulic pressure with proprietary abrasive media pressed through the nozzle orifices by an Abrasive Flow Machining process. Each set is machined to a flow tolerance of less than flt 0.5% tighter than even factory balance flow rates for optimum performance in your engine. This process further smooths the internal fuel passages in the nozzle while opening it up to the desired diameter according to the prescribed additional flow over stock. They offer injectors with enhanced flow ratings ranging from 30% over stock up to 200% over stock, as well as custom sized injectors for competition engine needs. Also, S&S helped engine builders integrate alternative injector bodies into solid



6 & 7 You can see the mass of machining and test equipment they have on hand to work their fuel system magic.



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competition engines when fuel demand surpasses the physical limitations of factory based injectors.

MODIFIED CP3S

The S&S team builds "stroker" CP3 pumps in 10mm, 12mm and 14mm configurations that deliver more fuel per rotation than a stock CP3 pump that only has about 8 millimeters of stroke. The long stroke pumps feature a new shaft with a larger diameter cam lobe and shorter pistons to deliver more fuel with each revolution of the shaft. They also offer conversion kits that upgrade new model GM trucks from the troublesome CP4 pump to a reliable CP3 while maintaining the necessary emissions related equipment.

TUNING

To wrap up a complete fuel system, the team at S&S Diesel Motorsports also sells and programs the Bosch Motorsports stand-alone ECUs that can be used to take full control of the engine electronics as well as auxiliary functions within a given race truck. They also offer the necessary high-range pressure sensors, high-range relief valves, custom high pressure lines, high volume fuel rails and all the other components needed for a complete competition level fuel system. **DW**



8 This fixture accepts up to 16 common-rail injector nozzles at a time for Abrasive Flow Machining.



9 The fixture and nozzles are slid under the press where the abrasive media is forced through the nozzles under a great deal of pressure to enlarge and smooth the path of fuel flow through the nozzle.



10 Greg Spoolstra operates the AFM machine to show us the process S&S nozzles go through.



11 The abrasive media looks and feels like "Silly Putty" that you probably played with as a kid. When it is forced through the nozzle abrasives within, the media removes material from the internal walls of the nozzle as it flows past.



12 To simulate the part of the AFM process that we could not see, Spoolstra loaded a nozzle into a vice and then pushed the abrasive media through the nozzle by hand showing the trails of media from each of the nozzle's five holes.



13 The S&S team has a large test machine to measure and verify injector flow and solenoid operation. Each injector within a set is matched to flow within 0.5% of each other which is a tighter tolerance than OEM standards.

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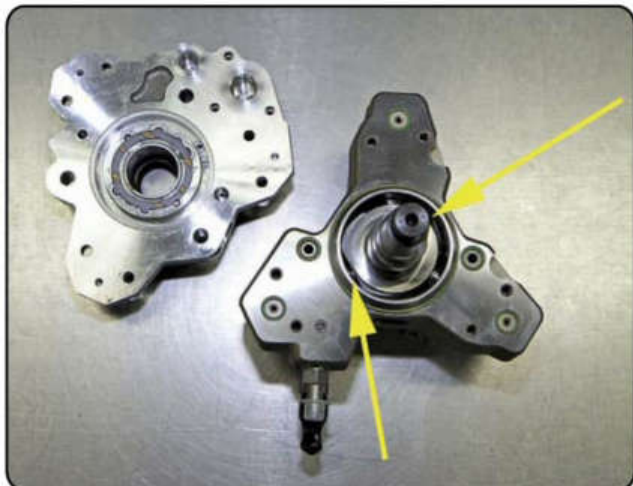
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14 Here is a selection of some of the injector options offered by S&S Diesel Motorsport covering everything from stock type injectors up to monster injectors for custom applications. From left to right are injectors for an LB7, LBZ, LML (piezo-electric), 5.9L Cummins, 6.7L Cummins (next gen), 6.7L Scorpion, Case IH and LE (Large Engine with 2.5 to 3.0L per cylinder).



15 Looking at the inside of a CP3 pump, you can see the pump shaft (arrow on the right side) while the arrow to the left side of the shaft points to one of the cam followers (buckets) that ride between the polygon and the plungers in each of the three bores which pump the fuel to build the tremendous pressure needed for the common-rail fuel system to function properly.



16 Here are three of the custom pump shafts S&S uses for its "Stroker" pumps. Notice that the base circle of the cam has a larger stroke as you move from the shaft on the left to the larger ones in the center and on the right. These are the 10mm, 12mm and 14mm shafts (from left to right) used in their high performance CP3 pumps.



17 On the left is a stock CP3 cam bucket that is used in a standard stroke pump while the bucket on the right is the custom designed unit that S&S uses for their 12mm and 14mm pumps. They use a modified factory bucket for their 10mm pump.



18 A stock CP4 is shown on the left with the S&S replacement CP3 unit shown on the right. The CP4 to CP3 upgrade kit for the Duramax engine will even work with the ninth injector for emissions compliance, while replacing the troublesome CP4 with the more reliable CP3.



19 For big-power custom applications, the crew at S&S has larger pumps available in their arsenal, including: a huge CP9 that supports over 3,600-horsepower, and a two element CPN5 that is good for over 1,000-horsepower, along with the more familiar CP3 and CP4 pumps as seen from left to right.

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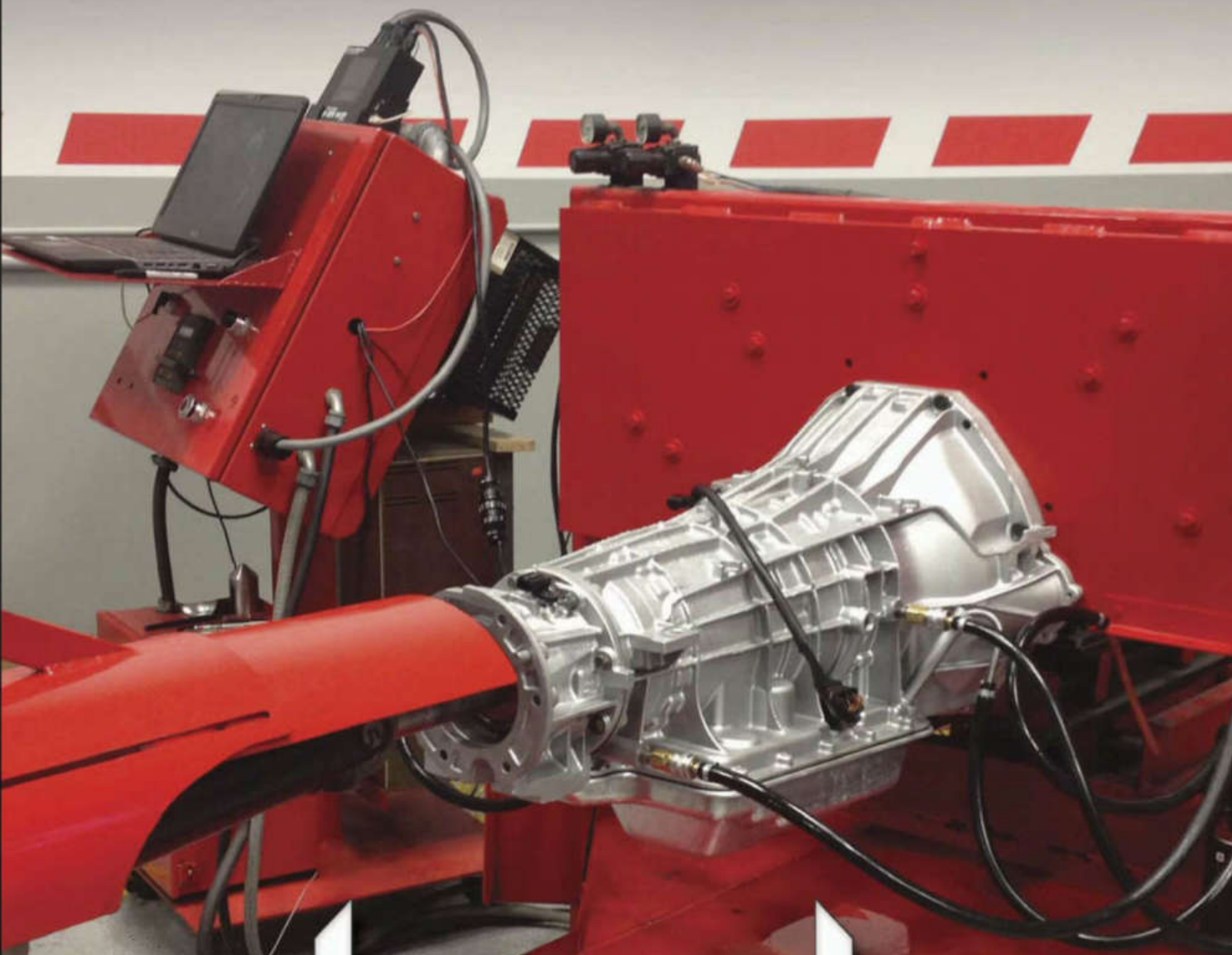
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THE TRUCK CALLED **DJANGO**

Weaver's Shop Truck Turned
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TEXT BY MIKE ALEXANDER
PHOTOS BY JONATHAN GLOVER

In the world of custom trucks every detail counts, and the more unique those details are the better. Randy Weaver, owner of Weaver Customs in West Jordan, Utah, knows this all too well, and he's made a living producing killer, subtle details for custom automotive owners nationwide. When Weaver decided to customize a "shop truck" of his own, it was no surprise that the project quickly turned from creating a parts-getter to putting in all of the details to make this classic Ford the one-of-a-kind show-piece that you see here.



The Ford was backhalved with a custom 4 link to help clear the massive tires and to make sure all the Cummins power makes it to the pavement through the narrowed 9-inch rearend.

"THE MASSAGED 5.9L CUMMINS DIESEL ENGINE, TOPPED OFF WITH A COMPOUND TURBOCHARGER SETUP, PACKS A MIGHTY 1,000-RWHP PUNCH"

As a 1962 Ford F-100 unibody pickup, this classic truck was gifted with iconic bodylines and personality right from the factory. It wasn't until after many years of

abuse that the truck developed an even more defined sense of character, one that Weaver picked up on immediately when he noticed that the truck's rear brake

drums were ground down flat from being dragged for many, many miles in its past life. Ready to give the truck a new lease on life, Weaver named it Django, and similar



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to the movie character, this truck has been freed and made anew. Initially the Ford was bought to be a shop truck, one that could haul parts and tools around with classic looks and style. But shortly after the build began, it became clear to Weaver and his crew that the truck was going to end up being much more than initially planned. Yes, that tends to be a common theme in these pages, but read on.

DRIVE TRAIN

Django has a custom suspension setup that not only gives the truck its noticeably grounded stance, but also plenty of heft to deal with the turbocharged Cummins under the hood. Ridetech control arms paired with double adjustable shocks on all four corners keep the ride comfortable, while the custom geometry both front and rear allow for the massive Pirelli tires on the beast to tuck up under the body with plenty of pavement-gripping power. Of course, there has to be an abundance of rubber-to-pavement contact



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The custom center console, seen here, is fitted with an antique 1845 Colt revolver.

in order to keep this powerful beast planted, since the massaged 5.9L Cummins diesel engine, topped off with a compound turbocharger setup, packs a mighty 1,000-rwhp punch.

MASSAGED AESTHETICS

With something so powerful and performance-oriented, it's only fitting that the exterior suits its beefed-up heart. Weaver set to giving the Ford some unique aesthetic qualities, including a chopped and extended roof line, laid-back windshield, suicide doors, shaved drip rails, a custom hood, custom front and rear bumpers and that impressive shortened and smoothed bed. All of this is



Instead of slamming his classic Ford on the ground, Weaver moved the front suspension forward and the fenders up on the truck to give the truck its one-of-a-kind stance.

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accentuated with a custom Axalta Chai Bronze and Silverstone Gray paint scheme with custom graphics and Laser Red pinstriping. Inside, the truck is just as unique, featuring custom seats covered in distressed deep red leather upholstery, a one-piece leather headliner and a custom all-steel dash with Dakota Digital gauges. While the truck maintains its vintage appeal, all of the modern amenities, from power windows to air conditioning and a full Kicker sound system, are all present in this expertly built "shop truck."

Weaver certainly showcased both his customization and design skills with this build, doing just about everything except for the interior on his own with help from his crew. For that reason alone, Django will remain an icon of creative freedom in the customization world well into the future. **DW**



Built for performance and show, Weaver's Ford boasts 1,000 hp to the rear wheels thanks to a custom compound-turbocharged 5.9L Cummins.



To accommodate massive 405 rear Pirellis, Weaver constructed a custom rear back-half and suspension setup for this truck.

Owner:
Randy Weaver
1962 Ford unibody F-100
Sandy, UT

THE TRUCK CALLED **DJANGO**

ENGINE:

1996 Cummins diesel
Block deburred and machined
Common Rail camshaft
Ported and polished head
Custom valves
Custom radiator
Spal cooling fans
Hand-fabbed intake manifold and stainless air intake
13mm P series pump
Compound turbocharger set up good for 100 psi
Stead Speed exhaust manifold
Custom 4- and 5-inch exhaust with Flowmaster mufflers
1,000-rwhp
Engine assembled by: Randy Weaver and Justin Askerland

SUSPENSION/CHASSIS:

Adjustable four-bar rear suspension
Custom rear back-half to accommodate the massive tires
Crown Vic front suspension moved up to achieve the right stance
Ridetech double adjustable shocks and control arms
Wilwood 14-inch brakes and master cylinder
Ford 9-inch rearend with custom-narrowed housing
Detroit locker with 3.89 gears
31-spline axles
Custom wheelbase
Performed by: Weaver Customs

ROLLING ATTIRE:

Wheels: Polished 20- and 24-inch Boze wheels
Tires: 245/35/20 and 405/25/24 Pirelli tires

BODY/PAINT:

Chopped 1.5 inches
Windshield laid back 1.5 inches
Custom hood with floating emblems and leather hood straps
Custom hand-fabbed grille
Custom race-styled front and rear bumpers with diffuser in the rear
Widened front fenders 1.5 inches and moved up 1.5 inches
Custom bed shortened 1 inch with smoothed and custom bed floor
Suicide doors
Shaved drip rails
Roofline extended ½ inch
Custom belt line treatment
Custom Axalta Chai Bronze/Silverstone Gray paint
Custom Silverstone Gray graphics
Laser Red pinstriping
Semi-gloss accents throughout
Bodywork and paint done by: Weavers Customs

INTERIOR/STEREO:

Custom distressed seats
One-piece leather headliner
Custom center console with 1845 Colt centerpiece
Custom all-steel dash
Dakota Digital gauges
Billet Specialties steering wheel
Vintage Air
Custom one-off sterling silver door pulls engraved with "Django" handcrafted by saddle maker Jud Judd
Interior done by: Justin Stephens of JS Custom Interiors
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69128/69210

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67181/62300

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SUPER COUPON

HIGH LIFT RIDING LAWN MOWER / ATV LIFT

PITTSBURGH

• 300 lb. Capacity

LOT 61523 shown
60395/62325/62493

SAVE \$60

\$8999

REG. PRICE \$149.99

34767125

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9 PIECE 1/4", 3/8" AND 1/2" DRIVE WOBBLE SOCKET EXTENSIONS

PITTSBURGH

LOT 61278/67971 shown

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REG. PRICE \$24.99

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SUPER COUPON

29 PIECE TITANIUM NITRIDE COATED HIGH SPEED STEEL DRILL BIT SET

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5889/62281

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PITTSBURGH

LOT 93840/69512/61858/69445 shown

• Includes Ram, Hook and Chain

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34751705

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69229 shown

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SUPER COUPON

3 TON HEAVY DUTY STEEL JACK STANDS

PITTSBURGH

LOT 38846 shown
69597/61196/62392

SAVE 55%

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PITTSBURGH RAPID PUMP® 3 TON LOW PROFILE HEAVY DUTY STEEL FLOOR JACK

SAVE \$85

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62670/61253
61282 shown

\$8499

REG. PRICE \$169.99

• Weighs 73 lbs.

34746801

SUPER COUPON

PITTSBURGH LOW-PROFILE CREEPER

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LOT 69262
69094/61916
2745 shown

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LOT 60243/47077 shown
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SUPER COUPON

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LOT 61609/67831 shown

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\$31999

REG. PRICE \$649.99

34757740

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30", 5 DRAWER TOOL CART
LOT 61427/95272 shown
• 704 lb. Capacity

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69111/62522 62573

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WOW SUPER COUPON

2500 LB. ELECTRIC WINCH WITH WIRELESS REMOTE CONTROL
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61840/61297/68146

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32 PIECE SCREWDRIVER SET PITTSBURGH
LOT 61259/90764 shown

\$5.99 ~~REG. PRICE \$14.99~~

SAVE 60%

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WOW SUPER COUPON

SAVE OVER \$51

WE CARRY A FULL LINE OF WELDING WIRE

90 AMP FLUX WIRE WELDER
LOT 61849/62719 • No Gas Required
68887 shown

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WOW SUPER COUPON

2.5 HP, 21 GALLON, 125 PSI VERTICAL AIR COMPRESSOR CENTRALPNEUMATIC
LOT 67847 shown
61454/61693/62803

SAVE \$70

\$149.99 ~~REG. PRICE \$219.99~~

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WOW SUPER COUPON

MECHANIC'S SHOP TOWELS PACK OF 50
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61878/69649/61837

SAVE 50%

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MEDIUM LOT 62434 62436
LARGE LOT 62433 62428
X-LARGE LOT 62432 62429 shown

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WOW SUPER COUPON

SAVE \$160

45 WATT SOLAR PANEL KIT
LOT 62443 68751 shown

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WOW SUPER COUPON

1/2" ELECTRIC IMPACT WRENCH CHICAGO ELECTRIC
LOT 69606/61173 68099 shown

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WOW SUPER COUPON

40 LB. CAPACITY FLOOR BLAST CABINET
LOT 62144 68893 shown

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WOW SUPER COUPON

CENTECH AUTOMATIC BATTERY FLOAT CHARGER
LOT 42292 shown
69594/69955

SAVE 70%

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WOW SUPER COUPON

2 PIECE VEHICLE WHEEL DOLLIES PITTSBURGH
• 1500 lb. Capacity
LOT 60343 67338 shown

SAVE 37%

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ADJUSTABLE SHADE AUTO-DARKENING WELDING HELMET
LOT 61611 46092 shown

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WOW SUPER COUPON

6.5 HP (212 CC) ORV HORIZONTAL SHAFT GAS ENGINES PREDATOR ENGINE
LOT 60363 69730/68120
LOT 68121 69727 shown
CALIFORNIA ONLY

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Hot Rod RV Intake

Installing an AFE Stage II Intake for Power and Performance

TEXT AND PHOTOS BY JASON SANDS

In this installment of our Hot Rod RV project, we'll be taking the same first step as many other diesel truck owners do: installing a performance intake on our '97 Dodge Ram 2500. Especially in older vehicles, like our Dodge, the intake tract is only designed for a certain level of horsepower and flow. As larger turbos are added, the intake actually becomes a restriction, as the turbocharger tries to suck air through a filter that can't keep up with its volume draw. Even on stock trucks that have had the waste gate disabled, we've seen the filter minder sucked down flat, as the factory air box becomes a restriction.

AFE STAGE II

To address this problem before we ran into it, we installed an AFE Stage II intake kit, one of the higher flowing versions on the market. With a huge airbox (air intake chamber) and equally impressive conical filter, the AFE would be able to hang with any turbo that we'd install on the truck, especially since we'd be keeping our compressors rather small and focused on response.

In addition to the future flow benefits, the factory air silencer is also removed, creating a cool turbo whistle. During previous long-term testing, we've also seen mileage gains of about 1 mpg, although we haven't put enough miles on our RV Ram to back-up or disprove this claim, yet. Intake and exhaust systems can be thought of as paving



the way for future performance modifications. So without further ado, we'll show you how to replace the stock airbox with a performance model from Advanced Flow Engineering. **DW**



2 Our factory airbox, although functional, wasn't much to look at and had seen plenty of miles. The previous owner had used the space between the intake and battery box for storage, and below the white rag in the picture, we found a pair of vice grips, three more rags, and a spare coolant hose.



3 The filter minder on our stock intake didn't show any signs of being sucked down, so at the boost we were at, our current intake was probably doing an OK job.



4 To show just how easy an intake install can be, we're going to use a single multi-use screwdriver for the majority of the job and not even a good one, either.



5 The first step to removing the intake is to loosen the clamp on the turbocharger. We were careful not to knock any debris into the inlet of the turbo when performing this step.



6 The factory clamps have holes and ridges incorporated into them so that the factory airbox will stay on, even if the clamps become loose.



7 After the clamps are removed, the factory flex-fit hose can be removed.



8 Our turbo looked well used, so we took a moment to check for play in the shaft. Side-to-side movement is OK, but back-and-forth is not. As far as we could tell, our turbo would be in good shape for many miles to come.



9 Before removing the stock airbox, it's always good to pop the lid and check the condition of the filter. Remember the clips in back by the firewall.



10 We had our first surprise when we took the filter lid off: This drop-in aftermarket filter had already been added. Since we were after more flow than the stock filter could provide, we went ahead with the intake removal.



11 Removing the airbox is as simple as pulling towards the engine and up, which removes the box from its three mounts and pulls the air silencer (pictured) from the inner fender.



12 We were now intake-less, which is where the new AFE would come into play.

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13 If you think of a conical filter spread out and rolled flat, you can see how much more surface area the AFE filter has compared to the filter in the stock airbox.



14 So we didn't have to mess with it later, the first thing we installed was the filter to the inner portion of the AFE airbox.



15 There are three rubber grommets that must be installed in the bottom of the airbox to properly line the unit up with the factory mounts.



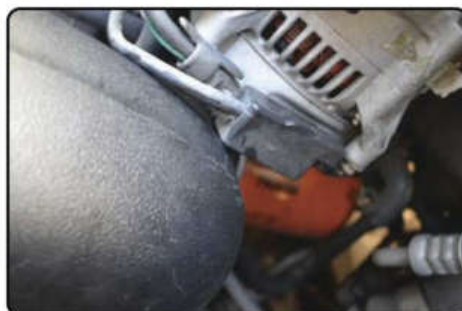
16 With the size of the new airbox, the battery cable was hitting the side when we tried to install it. A little bit of rotation, and it was out of the way.



17 In this photo, how much larger the new AFE airbox is compared to the factory setup is clear. It comes with a turbo-to-intake connection that is equally massive.



18 With the airbox in place, it was time to connect it to the turbocharger. For this step, sliding the intake boot over the turbocharger before installing the airbox connection will save quite a bit of headache.



19 With the molded intake tract connected to the turbo, you can see how little room there is between the intake and the alternator.



20 We were almost finished! Here is a good shot of just how massive the airflow path is on the AFE unit, as compared to the stock intake setup.



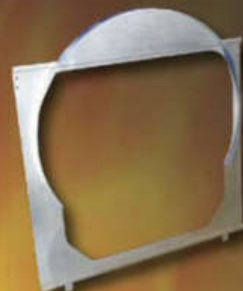
21 We'd left everything loose to get it fitted right, but now it was time to clamp everything down. Keep in mind that if you forget a clamp or can't arrange everything into place, clamps can be taken apart (like so) and added at the end of the installation.



22 With the finished product looking good, we were ready to hit the road. Up next for the RV Ram comes more power and more airflow so that we can actually take advantage of our cool, new intake.

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TINUM



DieselSellerz.com's Platinum 6 Door 6x6 2013 F-350 Monster Truck

BY ADAM BLATTENBERG
PHOTOS BY ADAM BLATTENBERG,
JASON SANDS AND CHRIS TOBIN

When you work in the diesel industry and sell modified trucks for a living, you have to turn your daily driver into something really special, right? That's exactly what Keaton Hoskins, the co-owner of DieselSellerz.com did. (Instagram: @the.muscle) He built himself an extreme truck, which he calls the Platinum666 (6.7 Power Stroke, 6 doors, 6 wheel drive Platinum edition Ford). Keaton picked up this 2013 F-350 Dually intending to feature it at the upcoming SEMA Show in Las Vegas, only to give it away shortly after. What was his motivation? Well, it wasn't just to give a truck away: "The reason I built the Platinum666 is because I wanted something different. Big and still very usable. People think it's crazy to buy a 60k truck and chop it up and then rhino line it. But, I love being different." What's even more different is that Keaton built this truck in only 14 days.

DIESEL
WORLD

THE STRETCH

After picking up the Super Duty, Keaton immediately sent it off to Stretch My Truck where they cut the back of the cab off and split the frame in roughly the same area. The back half of another 2013 Super Duty was then grafted onto the back of the Platinum. A section of steel was then used to extend the frame and all fuel lines, brake lines and electrical were extended to match. Stretch My Truck did an amazing job: Looking under the truck, it's hard to tell where any work was done. It all looks stock.

While Stretch My Truck was finishing up their work, LRM Kevlar flew in to spray the Kevlar based coating on the exterior, as well as select parts of the suspension. Keaton chose the Kevlar based product because, as he says, "DieselSellerz.com prides itself in building high end SEMA type trucks—and then taking them out and beating on

"THESE 6.7L ENGINE BAYS ARE TIGHT AND DON'T FIT (LARGER AFTERMARKET) TWINS EASILY. SO AFTER R&D AT ATS, WE DECIDED ON A SINGLE TURBO KIT FROM ATS DIESEL"



Under the hood rests a decently modified 6.7L Power Stroke. An ATS 5000 non VA turbo kit (which has since been swapped out to one from H&S Motorsports) 30% over injectors from Dynamic Diesel Products, and a tune from H&S Motorsports (with the help from PPEI) take it a step above stock.



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Specifications

2013 F-350 Platinum DRW 4x4

ENGINE: 6.7L POWER STROKE

ARP Head Studs
ATS Diesel Turbo Kit (71mm)
Dynamite Diesel Products 30% Over Injectors
Tuned by PPEI with help from H&S Motorsports
H&S Motorsports Maxx Calibration Control
Custom Diamond Exhaust Stacks by Dynamic Metal Works LLC
Edge CTS2 for gauge monitoring only
FASS 150 Lift Pump
H&S Dual CP3 Kit (stock CP4 kept in valley)
Estimated 800 hp

TRANSMISSION:

SunCoast

SUSPENSION:

10-inch Lift Kit by McGaughys
King 3.0-inch Custom Valve'd Shocks with Remote Reservoir's
Custom 10-inch Coils Up Front by King Shock

BODY MODIFICATIONS:

6 Door Conversion by StretchMyTruck.com
Kevlar Based Exterior Coating by LRM Kevlar
Fusion Bumpers Front and Rear
Monster Hook and Swivel Hook's on Bumpers
RaceMesh Truck's Grille
Dynamic Metal Works LLC Custom Headache Rack

INTERIOR:

Custom Leather Seats by Road Wire

LIGHTING:

Headlights Built by EcoTintShop
40-inch Light Bar in Grille
LEDs by DieselPowerGear.com

WHEELS:

American Force 10-Lug 22x12-inch by Independence Super Duty

TIRES:

Interco M16 40x14.5



Suspension out back consists of a set of traction bars and new leaf springs also from McGaughys.

them.” Long story short, the bed-liner like coating was the only thing that would handle the abuse and still look good after.

Before Stretch My Truck could get the interior put back together, the suspension install began. A 10-inch McGaughys Fourlink kit was installed which consisted of new coils (soon to be replaced with King Coilover shocks) four link set-up, rear traction bars, rear

leaf springs, and a mess of odds and ends. A set of 22-inch by 12-inch American Force Independence Super Duty wheels were custom powder coated to match the body and were wrapped in a set of 40-inch tall Interco M16 tires as rolling stock.

800 HP POWER STROKE

Next in line was the engine. First and foremost, a set of ARP

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A set of Fusion Bumpers front and rear look perfectly at home on this over the top build. The Monster Hooks tow hooks were treated to a layer of Kevlar coating like the rest of the truck.

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Head Studs was installed, as well as a set of Dynamite Diesel Products 30% over injectors. The truck was then sent off to ATS Diesel where they installed a 71mm turbo system. It was then tuned with the help of Korey Willis from PPEI using H&S's Maxx Calibration Control tuning system. Keaton relies on an Edge CTS2 to monitor the engine's vitals from within the cab. Finishing up the performance mod's, the truck made a trip to Dynamic Metal Works where they fab'd up a set of diamond cut stacks hooked up to a custom headache rack made especially for Keaton's truck. When we left the truck and went to print, it hadn't



Race Mesh Truck grille with a 40-inch Diesel Power Gear LED Bar.



A massive set of American Force 22x12-inch Independence Super Duty wheels were powder-coated to match the truck's exterior, and they fit the build perfectly.





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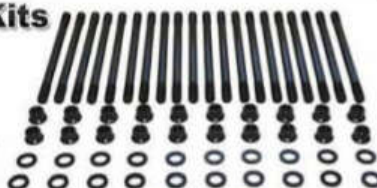
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been dyno'd, but similar setups have cracked 800 hp.

Many would think that a stretched six-door F-350 would be completely unusable. But nothing could be further from the truth: Keaton regularly tows his 40-foot gooseneck trailer with the Platinum666, and he also takes it off-roading. And we're not talking fire trails: This truck sees everything from sand dunes to thick mud on a regular basis. It's definitely a different truck, just as Keaton wanted it to be. And it could be yours. **DW**

**"THE BACK
HALF OF
ANOTHER
2013 SUPER
DUTY WAS
THEN
GRAFTED
ONTO THE
BACK OF THE
PLATINUM"**



The 10-inch 4-link lift is achieved using a kit from McGaughys. Future mod's include coilover shocks from King Shock which will replace the current coils and stock mount shocks.



EcoTint custom built a set of headlights for Keaton's truck. They're painted to match and feature Diesel Power Gear LEDs in place of the stock incandescent lights.





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Project 6. Ole' Reliable

Part 2 – Air Density Package via Banks Power

BY JACOB WHITE

Our project was introduced in the September issue of Diesel World as somewhat of a “budget builder” to show readers that while the 6.0L has been known for its problems, with the right aftermarket parts and maintenance schedule, they can be setup to make great power, offer decent fuel mileage and do anything the average diesel owner would need.

This 2005 XL Work Truck model was bought for just \$5,000 and is being used as a company delivery vehicle hauling product and trailers all over the Rocky Mountain region. The truck had previously been outfitted with Absolute Performance's Delta and Coolant Filtration kits to help maintain more consistent coolant and oil temperatures, and in the first installment of this project, a Banks Power Six Gun tuner with iQ monitor, Banks Ram Air intake and Banks 4-inch Monster exhaust was installed. This combination of parts showed an 8.5% increase in fuel mileage along with eliminating some turbo lag and improving power and throttle response. This second installment of the project goes deeper into the science behind air density, and dropping charge air temperatures with a Banks Techni-cooler, High Ram intake elbow and Double Shot Water/Methanol injection system.





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TECHNICOOLER

The Banks Power Technicooler system includes a more efficient intercooler core with all-aluminum end tanks, mandrel bent high flow 3.5" boost tubes and High Ram intake elbow, these parts work together to increase air volume by over 21% with up to a 64% reduction in pressure loss. The Technicooler uses a 19%

thicker core compared to stock that will cool charge air temps better to increase density before entering the engine. Denser air carries more oxygen which helps to improve combustion and overall engine efficiency. When used with the increased fueling from Six Gun tuner this package offers higher continuous power, better fuel economy and lower EGT's.



1 The Banks Double Shot Water Methanol system can be used to maximize engine performance by cooling the intake air temperatures, resulting in a denser air charge. The included digital controller, high volume pump and large 7-gallon reservoir install in just a couple hours and can be setup with multiple different injection nozzle sizes and injection calibrations to fine tune the system for any application, be it for power, EGT control or fuel mileage.



2 The Banks Power Technicooler kit for the 6.0L Power Stroke can improve airflow through the charge air system by over 38% by using a larger free flowing intercooler core, large 3-inch intercooler piping and the High Ram intake elbow; the air from the turbocharger has a less restrictive passage to the cylinder heads and will equate to improve throttle response, cooler air temps, lower EGTs and quicker turbo spool-up.



3 The upper radiator core support needs to be removed, along with a few other components to gain the access needed to get the old unit out. The air box, driver side battery and battery box will also need to be removed to get the intercooler piping swapped out. The hood latch will need to be unbolted from the core support and laid to the side. It's a good idea to mark the hood latch location so it can be reinstalled in the same location so the hood continues to close as it should.



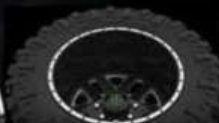
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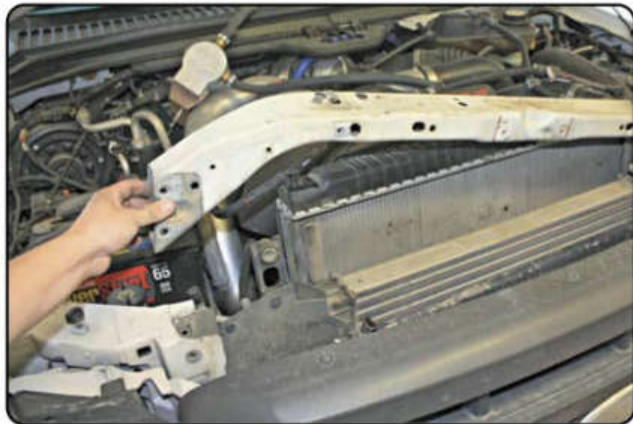
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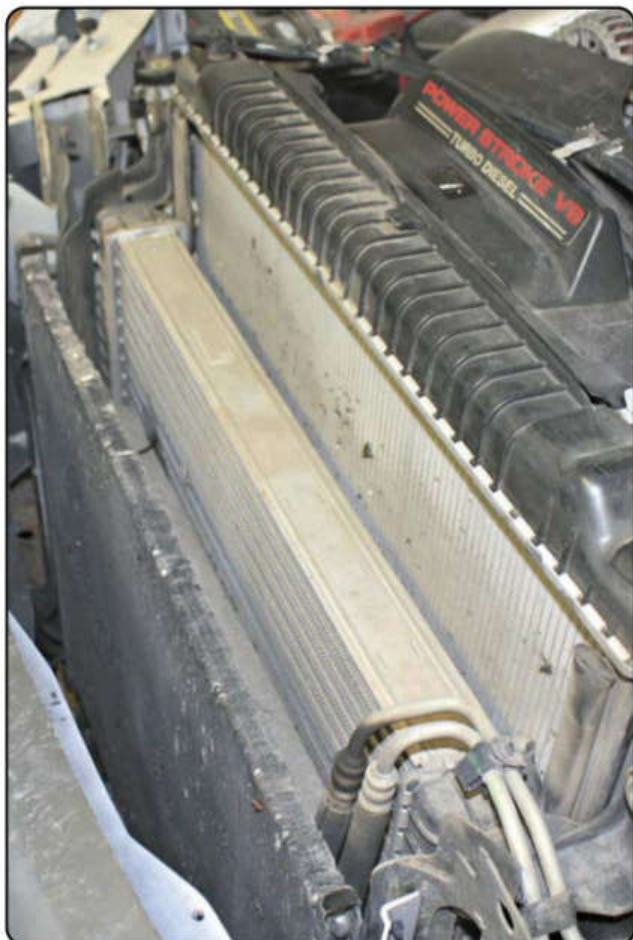


DOUBLE SHOT WATER METHANOL INJECTION

The dual stage Double Shot Water Methanol injection system only further aids the air density battle by injecting water into the charge air system to further drop temperatures and increase volumetric air density within the cylinders to increase power potential



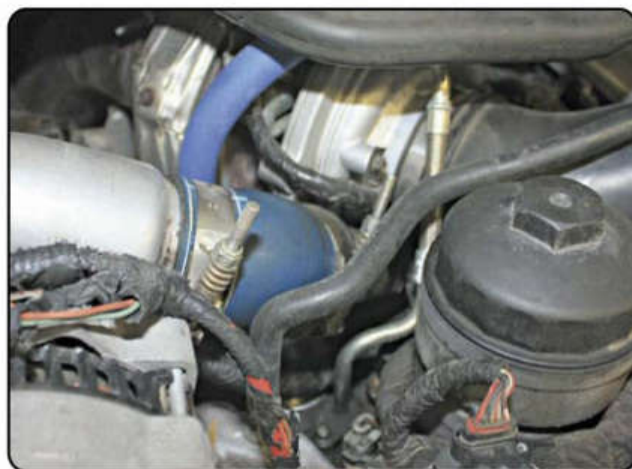
4 With the brackets and hardware removed, four 13mm bolts on the front and back of each side of the core support are removed, so it can be slipped up and out of its location. A pry bar may be needed to slide the core support out.



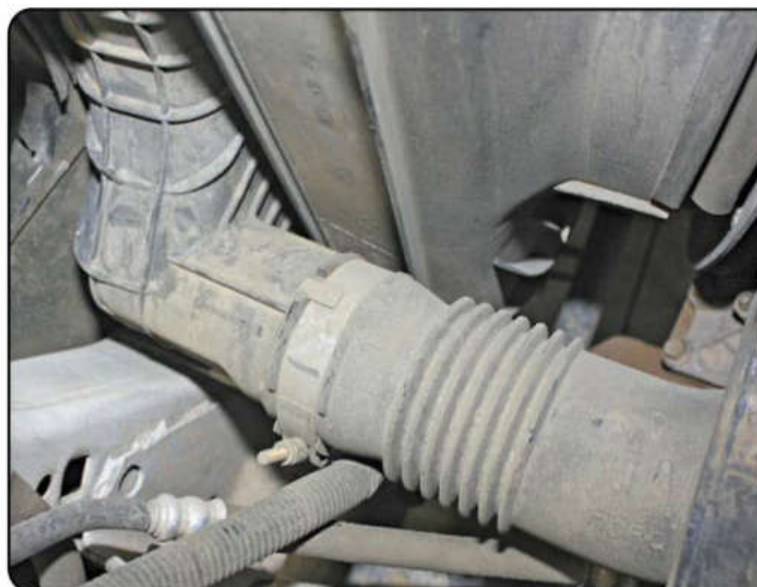
5 With the upper support out of the way, you get your first good glimpse of the stock intercooler located there between the A/C condenser and radiator. Before it can be removed, the driver and passenger side intercooler pipes are going to be unclamped and slipped out.

without increasing EGTs. The use of methanol, like the Banks Power Blend adds additional "fuel" into the cylinders, and Banks has seen gains of over 80 hp with just the Double Shot system alone (no additional tuning). Using a simple-to-use yet very sophisticated controller, the Double Shot system can be set-up to run both stages specific to each vehicle's needs.

By tapping into the truck's factory MAP sensor and/or installing the included EGT sensor, the system can inject the perfectly calculated amount of water methanol based off boost and EGTs. By ramping injection in slowly with the first stage at lower boost levels, the engine can take advantage of the additional density under light throttle situations, whereas the second power stage can come on stronger as boost and load increase for maximum cooling and power without harming the engine.



6 The passenger side (hot side) intercooler pipe connects directly to the turbocharger with this small 45-degree boot. This boot is prone to cracking and leaking, at which we were surprised to find hadn't yet happened to this 135,000 mile truck.



7 On this 2005 model year truck, the driver side (cold side) intercooler pipe is actually made of a plastic that has been known to blow out under heavy load and high boost applications. Just one more reason to upgrade to the mandrel bent 3.5-inch steel pipes included with the Technicooler kit.

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RESULTS

After installing the Six Gun tuner, Ram Air intake and 4" Monster exhaust, fuel mileage had been hovering right around 18.1-18.2mpg. After averaging out the mileage through four tanks of fuel and almost 2,000 miles of driving, these most recent upgrades, such as the larger Technicooler, 3.5-inch boost tubes and High Flow intake elbow, mileage has jumped another 4.5%, which is up to 18.9-19.0 mpg. This truck is used on an 80-mile daily

commute at highway speeds and is just a 2WD, so the mileage results may be a bit higher than what a crew cab 4x4 would see in the city, but with the fine tuning adjustments from the Banks Six Gun and the improved engine efficiency from better air density, it should still net solid gains in mileage and performance, regardless of the vehicle. The owners of this particular truck are quite impressed with the current 19-mpg figures and have already started seeing a cut in monthly operation costs. **DW**

	Stock Truck	Big Hoss Bundle with Double-Shot	Gain	% Gain
Peak to Peak Horsepower Gain over Stock (Hp)	270.4 @ 3300 RPM	401.8 @ 3100 RPM	131.4	48.6%
Peak to Peak Torque Gain over Stock (lb-ft)	441.6 @ 2200 RPM	792.8 @ 2400 RPM	351.2	79.5%
Best Horsepower Gain over Stock @ 2700 RPM (Hp)	215.4	387.1	171.7	79.7%
Best Torque Gain over Stock @ 2400 RPM (lb-ft)	426.7	792.8	366.1	85.8%



8 Note the stock intercooler pipes while serving their purpose of getting charged air from the turbocharger outlet to the engines intake manifold. The poorly designed and crimped piping definitely won't flow like the Banks system does. The factory oil saturated intercooler boots will also be replaced.



9 The factory intake elbow is then removed to make way for the better flowing High Ram Elbow. The sharp tight bends inside the stock elbow aren't conducive to good flow and upgrading can offer both better throttle response and improved mileage.



10 The much improved High Ram intake elbow from Banks can reduce pressure drop within the charge air system by as much as 64%; best of all, it's a super easy install that works in conjunction with the high-flow piping kit and larger Technicooler to offer the best air density possible for the 6.0L Power Stroke.

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11 Once the upper core support and factory intercooler pipes have been removed, it's just a matter of wiggling the stock intercooler up and out of the truck. It may be worth your while to enlist the help of a friend for this part of the job, as the intercooler can be a bit tough to sneak out by yourself.



12 The Technicooler uses a less restrictive core that will dissipate heat better while reducing pressure drop and improving airflow. The cooler the intake air temperature, the denser the air charge is going to be. Dense air means better power and cooler EGTs.



13 To make room for the larger High Ram intake elbow, the upper fan shroud plastic is going to need some minor trimming. The included template makes it easy to mark where the cuts need to be made. Just a small notch needed removed on this 2005 model. The 2003-2004 trucks will need trimmed a bit further.



14 Banks also includes a factory style intake elbow gasket that needs to be placed into the machined O-ring groove on the bottom side of the elbow. Even the smallest leak can create some negative effects in performance and efficiency.



15 Once the four mounting studs are torqued down to spec, the new driver side intercooler pipe can be installed using the supplied intercooler boots and clamps. A simple side-by-side comparison of the original equipment and the new Banks hardware should really be enough to explain the additional advantage in flow and air density to the engine.



16 The Banks Double Shot Water Methanol system uses a compact digital controller to allow full command of the soon to be installed dual stage injection nozzles. The gauge will also be used to display boost, throttle percentage, EGTs, and injection rate. Four nozzle sizes are included to help dial in the system to each vehicle's specific need.

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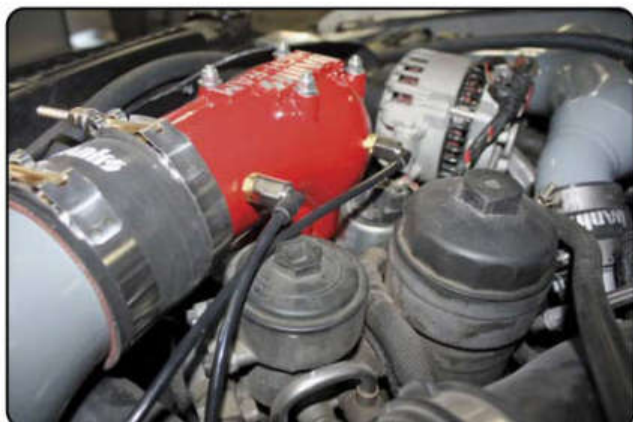
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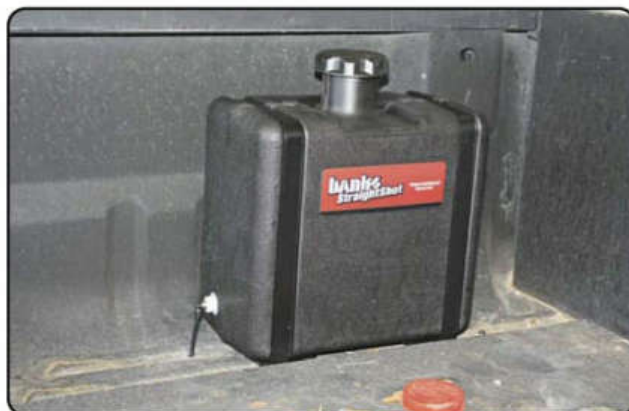
17 Using the water injection pump's bracket as a template, four holes can be drilled on the lower pinch weld area of the cab. The pump will need to be mounted in a safe spot, where road debris and water won't damage it. The high volume pump supplied in the Double Shot kit features a built-in pressure switch for low fluid and leak detection, a fully adjustable pressure regulator and integral push-lock fittings for easy install.



18 While the first stage of water injection will run strictly off the main pump itself, the second stage will get a boost in pressure from the stainless 3/16" solenoid to minimize pressure drop at that high flow nozzle. This solenoid will aid in fluid atomization entering the charge air system for the best power gains and air temperature reduction.



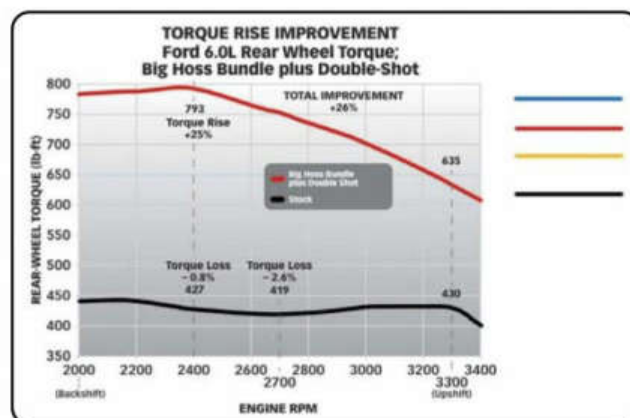
19 The dual stage nozzles for this system are drilled and tapped into the backside of the High Ram intake elbow. The primary stage is drilled right at the elbow inlet, while the power shot is tapped directly into the main bowl of the elbow, maximizing atomization and water/methanol distribution into the airstream to the intake manifold and cylinder heads.



20 Finishing up the installation is the massive 7-gallon fluid reservoir mounted along the inside driver frame rail. The tank's slim design helps reduce using the bed for hauling, while still giving plenty of fluid capacity for the water (EGT control) or Banks Powerblend Methanol (power, MPG and EGT control).



21 The digital controller included with the Double Shot Methanol injection system offers easy adjustability and straightforward two-button control of the system. Fine tuning the injection pattern can be based off either boost only, EGT-only or boost-and-EGT combined; ramping injection rates based off of these values offers safe, consistent results.



22 The provided chart shows the overall increase in torque from running the Double Shot Methanol system and Air Density package on top of the previously installed Banks iQ Six Gun tuner, Ram Air Intake and Monster Exhaust. Note the peak-to-peak gains of 96 hp/238lb-ft with tuning only and an additional 35 hp/113lb-ft with the Double Shot Methanol injection turned on.

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SMOKE

TEXT AND PHOTOS BY JASON SANDS

Every once in a while, there's a truck that just stops you in your tracks. Whether you're a Ford, Chevy or Dodge/Ram fan, there are certain trucks that just capture everyone's attention. A top fuel diesel? Yeah, that ought to do it. The carbon fiber body 2006 Chevy on these pages is the brainchild of diesel enthusiast Brian Spooner, who hails out of Lloydminster, Saskatchewan, Canada. Brian enlisted the help of good buddies Jamie Stojanowski and Curtis Halverson to build this monster, which is unlike anything the diesel world has ever seen.

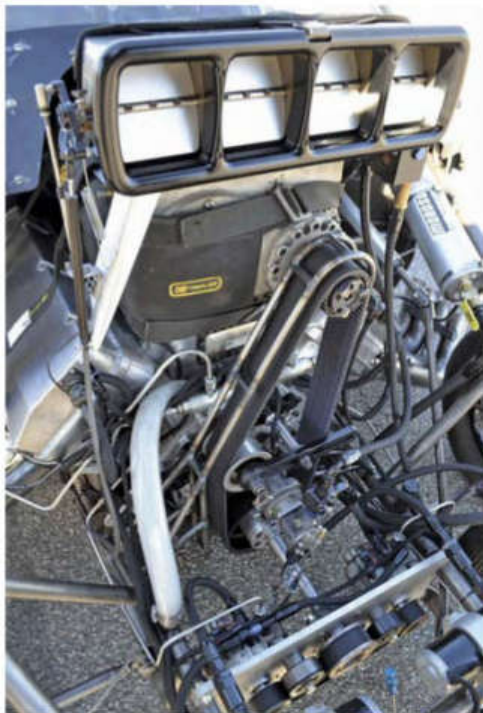


BLOWN SMOKE

2,000-HP BOTTOM END

Let's start with the basics. Most engines that come in production pickups are in the 5.9L to 7.3L range, while this engine displaces 511 cubic inches, or 8.37 liters. What's more is that it's based on a Top Fuel Dragster engine, so it's extremely stout and a lot lighter than most other diesel engines out there. The aluminum engine block is based on a Brad Anderson Engineering (BAE) design, and is filled, fire-ringed, and has ARP fasteners on both the main and heads. A Bryant crank swings a set of BME aluminum rods that are attached to a set of custom-made 13.8:1 compression ratio BME pistons.

Where things really start to get interesting though, is at the cylinder heads.



The heart of Brian Spooner's drag truck is this awesome 8.3L engine based upon a Top Fuel powerplant. It's visually different than any diesel engine we've ever seen before, and also a heck of a lot louder. With an estimated 2,000 hp and 3,500 lb-ft of torque, saying it's a monster is an understatement.



There's a lot of magic going on under the valve cover of this one-of-a-kind diesel. What we do know is that the head is loosely based on a hemi design, with 500-percent Duramax injectors installed in place of spark plugs. There's also no combustion chamber, and the engine runs diesel pistons with bowls instead of hemi gas pistons.



Those enormous injectors require a lot of support, so twin FASS 260-gph lift pumps send plenty of fuel to multiple 12mm stroker CP3 pumps built by Exergy Engineering. The CP3s are also driven off a separate crank drive that was custom built for this application.



The twin tanks up front are for diesel fuel, and a water-soluble oil, which is injected into the engine just like water/methanol would be, to keep EGT under control.

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The big PSI 206D screw blower takes more power than a turbo to drive but is capable of instant boost as soon as the throttle is matted. The four-butterfly hat is also from PSI, while the lines under the hat are for the water/oil injection.



With many one-off pieces, a Moroso oil accumulator was employed at start-ups to reduce wear. The accumulator will also fire off quarts of oil instantly in case the engine ever loses pressure, to prevent bearing, ring, or other engine damage.



Diesel rear ends are strong but heavy. This fabricated, back-braced housing built by Scribner is both strong and light. The rear end has a diesel-specific 2.91 gears to keep the big engine in its power band.

The four valve per cylinder heads are based off of a blank design and feature huge flow numbers, shaft-mounted rocker arms and were custom-made specifically for this engine. A 12-month project by Curtis Halverson at Extreme Racing Engines, they were the key in making the engine, well, a diesel.

BIG OL' BLOWER

Another area where Brian's truck differs from most is in the induction department. On virtually all diesels, you'd normally find a turbocharger, or maybe two, but on this custom-built powerplant, a PSI 206D screw blower sits atop a Stage V top fuel intake manifold. Flowing an incredible 3,500 cfm (or about the same as a 100+mm turbo) the big supercharger is 234-percent overdriven, and sends 60 psi of boost to the engine. The rest of the power plant is just as exotic, with two 12mm stroker CP3 pumps from Exergy Engineering, mammoth 500-percent over Duramax injectors that were adapted to the application, and a Bosch Motorsports stand-alone ECU that controls the engine's injection system, handles data logging, and performs a myriad of other tasks. Tuning is handled by Andrew (S&S Diesel) and Jaime (J&R Automotive).

TRANSMISSION

The transmission that's built to handle the engine's estimated 2,000 horsepower and 3,500 lb-ft of torque isn't your average diesel gearbox. Built by B&J Transmissions, the three-speed transmission is most commonly used on Top Alcohol dragsters, funny cars and other top-tier drag cars. The planetary gear transmission is also able to use either a clutch or converter to mate it to the engine. In this case,

"THE BIG SUPERCHARGER IS 234-PERCENT OVERDRIVEN, AND SENDS 60 PSI OF BOOST TO THE ENGINE"



With the front end removed, one can see how far the engine is set back in the chassis to provide superior weight transfer upon launch.



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Brian and company chose a custom 2,500-stall Precision Industries torque converter, that's well suited to the blown diesel's instant throttle response.

ONLY THE BEST

The philosophy of using the best parts available extends to the chassis, suspension

and body and not just the drivetrain. The body is made completely out of carbon fiber, and helps reduce the truck's ready-to-race weight to a mere 2,850 lbs. The chassis is a double-frame rail design that will certify to 6.0 seconds in the quarter-mile, constructed out of chromoly steel, and was built by Brad Hadman.

If you're thinking that the rear end ought to be incredibly strong in order to handle the engine's 3,500 lb-ft of torque, you'd be right. The fully braced custom-fabricated rear axle was built by Scribner, and features a lightweight aluminum center section, 40-spline axles, and diesel-friendly 2.91 gears.



With a huge amount of diesel torque on tap, the rear rubber is equally large to provide the truck with the traction for fast times. The 34.5x16 slicks mounted on Weld Racing wheels should provide 60ft times in the 1.1-1.2 second range once the truck is ironed out.



The front wheels are also from Weld and are for drag racing purposes only. The spindle-mount wheels weigh an incredibly light 9.5 lbs. and cut down on both rotational weight and rolling resistance with the skinny drag tires.

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Brakes on the rear are from Strange Engineering, just like they are on the strut front suspension.

After hours of pouring over the details of the truck, we were deeply impressed with the level of skill it took to build such a ride. Unfortunately, a broken rocker sidelined the

Chevy in its first outing, so we'll have to wait and see if Blown Smoke can crack the NHRDA's existing 7.46-second Pro Stock Truck record. In the meantime, our hats are off to Brian, Curtis, and the entire J&R Automotive crew for pushing the performance envelope like never before. **DW**

"THE CHASSIS IS A DOUBLE-FRAME RAIL DESIGN THAT WILL CERTIFY TO 6.0 SECONDS IN THE QUARTER-MILE."



The interior is all business, with a carbon dash, minimal interior and tubular steering column. The black cover for the transmission is a transmission blanket, which serves as a protection for the driver from any flying parts should breakage occur.



The front suspension is also a drag race affair, as Strange struts are employed. Combined with a rack and pinion steering unit, the entire front steering, suspension, and brakes are under 100 lbs. combined.



The team is aiming high when it comes to performance. The rear wing is a Top Fuel-style unit that provides an awesome amount of down force at the top end of the track to keep the truck straight, while the dual parachutes are an NHRA requirement in case the truck tops 200 mph in the quarter-mile, which is a very real possibility.



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Duramax Tuner's 2001-2004 LB7 Stealth 64 Turbocharger

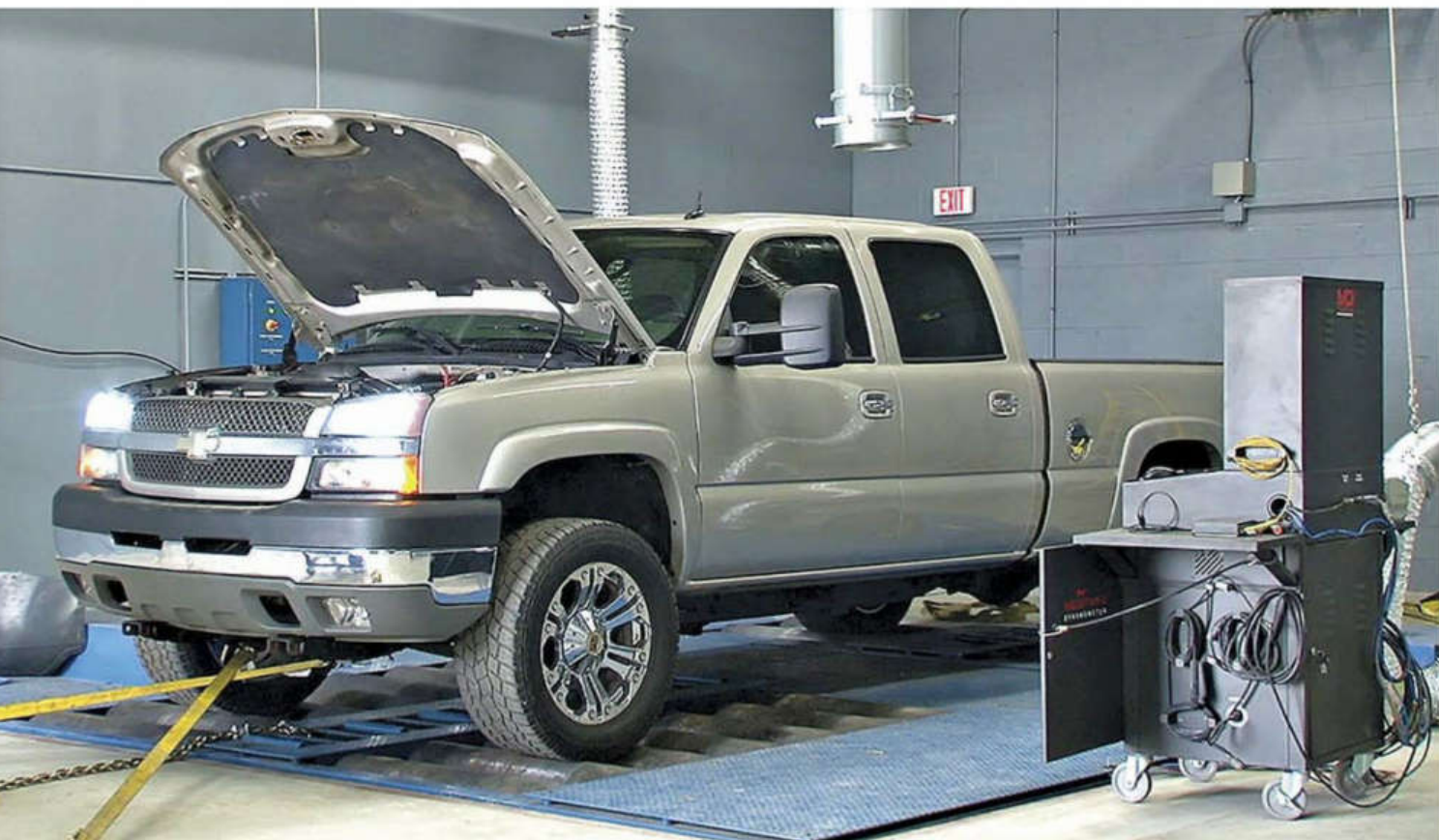
TEXT BY JS HANSEN
PHOTOS BY JIM ALLEN
AND CALIBRATED POWER SOLUTIONS

It's been 10 years since GM stopped producing the LB7 Duramax, but thanks to their longevity, efficiency and performance potential, the 2001-2004 GM trucks are still some of the most sought after light duty diesels on the road today. It may be getting hard to come across super clean low mileage LB7 trucks, but even at higher mileage (150,000+) if an owner has been diligent with regular maintenance, the LB7 can make for a great daily driver. With nothing more than a basic intake and exhaust upgrade, fuel lift pump, and some custom programming, the LB7 can produce around 530 rear-wheel horsepower. At these levels, owners will need to expect some transmission upgrades to support all that power, as the stock Allison 1000 in the 2001-2004 trucks will only hold around 430 hp safely before fifth gear clutch and torque converter slippage become an issue.

600 RWHP

With these modifications taken care of, the real performance-limiting factor with the LB7 Duramax is the factory IHI turbocharger. While the stock turbocharger can support up to 530 horsepower relatively safely, EGTs can get quite hot, and

the stock compressor wheel will start pushing past its efficiency range. To overcome some of these issues, Duramax Tuner out of Marengo, Illinois, developed their Stealth 64 as a true drop-in replacement for the factory IHI turbocharger. After extensive in-house testing on both their Superflow chassis



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"WITH NOTHING MORE THAN BASIC UPGRADES, THE LB7 CAN PRODUCE AROUND 530 REAR-WHEEL HORSEPOWER"

dyno and undergoing real world daily driving and towing situations, the new 64mm modified stock turbo offered gains of over 80 horsepower, making 600+rwHP while maintaining that same responsive off-idle boost and fast spool-up owners become accustomed to from their stock turbos.

HOW IT'S DONE

Built from take-off core turbochargers, Duramax Tuner tears the stock units completely down and reconditions them to virtually brand new conditions with an extensive and strict remanufacturing process that replaces all worn internals with new journal bearings, thrust bearing, seals and hardware. The factory turbine housings are inspected for cracks and are cleaned up to eliminate any rust or corrosion, and the factory wastegate actuator is modified to ensure maximum performance at higher boost levels. On the compressor side of things, the factory 10-blade compressor wheel is tossed in the recycle bin, and a larger extended tip 64mm compressor wheel replaces it inside the machined OEM compressor cover. The new compressor wheel design not only offers better airflow and increased volume but will keep pumping air efficiently up to 35 psi boost, making for a much wider and more usable power curve. The rotating assembly is balanced on a high-speed balancer to ensure longevity under extreme conditions and higher shaft speeds.

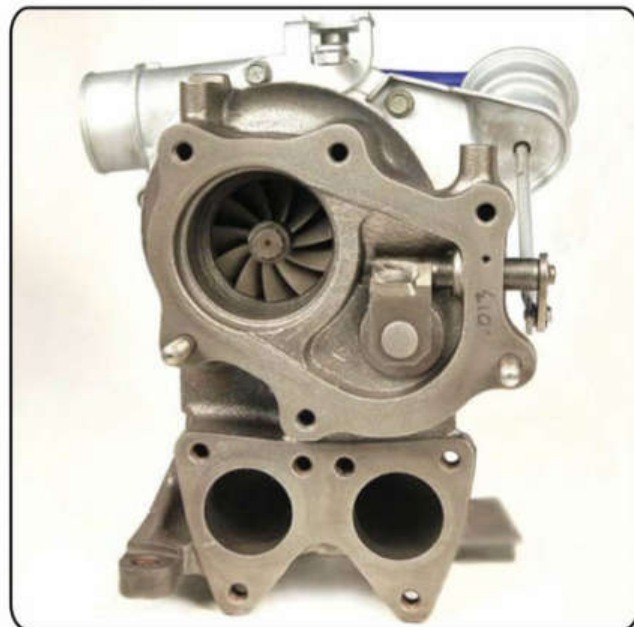


1 The Stealth 64 from Duramax Tuner offers true drop-in, bolt-for-bolt installation for the 2001-2004 LB7 Duramax and will support over 600 hp while maintaining great daily driver and towing performance. The larger than stock 64mm compressor wheel inside the factory compressor cover offers phenomenal power and torque curves while keeping that stealth look under the hood—keeping the competition completely in the dark.

DIRECT SWAP

The Stealth 64 offers a great performance upgrade without breaking the bank for those needing impeccable drivability on any truck from stock to 600 hp. Because the external pieces go unchanged, it's an easy install with no other changes or kit pieces required to make a fit. Duramax Tuner does recommend, however, that the stock downpipe be replaced with a less restrictive 3-inch pipe, along with a high flow intake elbow to ensure that the larger compressor wheel can get all the air it needs. The Stealth 64 is a very versatile turbocharger that can be used as a stock replacement on a 400-hp truck used for heavy towing or daily driving. The 64mm compressor offers good low rpm torque and good airflow through the rpm range for maximum EGT control on long grades. For the hot street and performance-oriented crowd wanting to compete in Work Stock sled pulling classes around the country, the Stealth has supported 610 to 625 horsepower with proper fueling and tuning support.

For those looking for more from their LB7 Duramax, the Stealth 64 may just fill that void, with solid power improvements and dyno charts to prove it. Whether your truck is used for towing a camp trailer on the weekends or yanking a sled down the dirt track at the local fair, the modified stock turbocharger can offer the airflow improvements needed to justify upgrading the old worn out turbo under the hood. **DW**



2 Built off of factory IHI turbocharger cores from the LB7 application, the used turbochargers are completely torn down, cleaned, bead blasted, machined, balanced and reconditioned to almost-new quality. All worn items are replaced, and some pieces are upgraded and modified to offer the best balance of power and drivability from a "stock appearing" turbocharger.

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3 The original 60mm 10-blade compressor wheel that comes in the stock LB7 turbocharger is sufficient in a stock application and will support up to 530 rwhp with the right supporting mods, but its design really limits flow as engine RPMs increase. This creates a very 'peaky' power curve with power peaking around 2,700 rpm, at which point, power will start dropping drastically. This compressor wheel shows signs of poor air filtration and dusting that has damaged the front edges of the blades, which hurts performance.



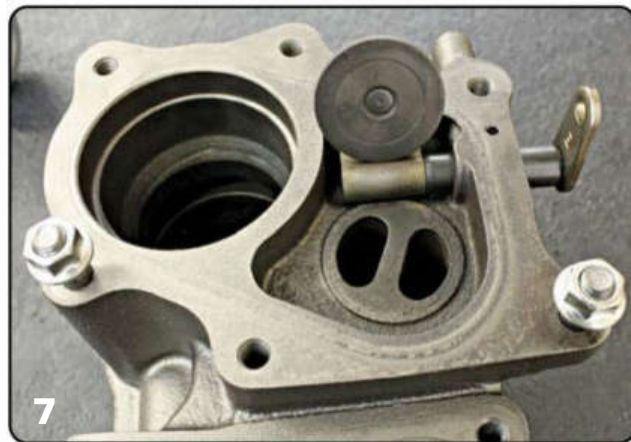
4 The new 64mm compressor wheels and turbine wheels are balanced as a complete rotating assembly on a high speed Heins Balancing Machine to ensure the new Stealth can offer the same durability and reliability you'd expect from an OEM turbocharger. With shaft speeds running in the 150,000+ RPM range, the slightest imbalance can really hurt longevity of the entire rotating assembly, including the wheels, bearings, shaft, and thrust washer.



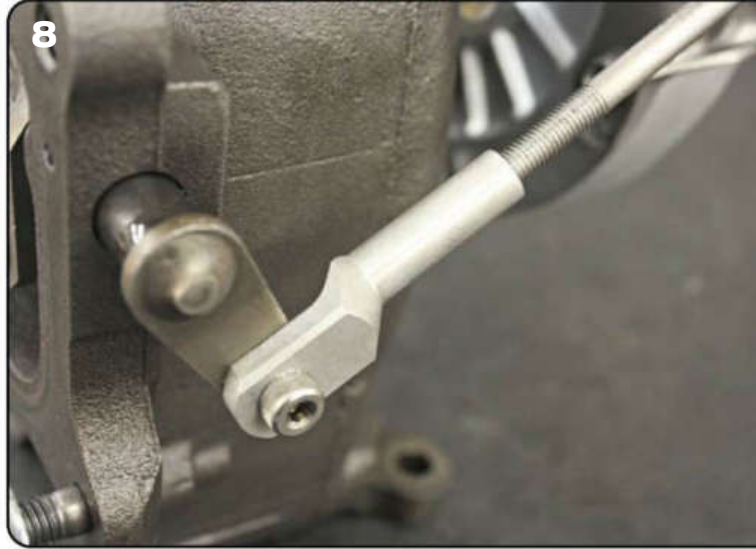
5 After some machining is completed on the compressor side back plate and the rotating assembly has been balanced, the center section can be assembled with all new internals that include new bearings, piston rings, snap rings and seals. The shaft and wheel are then torqued to spec.



6 The assembled cartridge is now ready to be placed into the OEM turbine housing and freshly machined compressor cover. By keeping the same external pieces, the Stealth 64 can be installed into the truck with no other changes needed. However, to optimize performance, Duramax Tuner does recommend that a high flow 3-inch intake elbow and downpipe be used in place of the factory pieces.



7 & 8 The factory IHI turbocharger uses an internal wastegate to control exhaust flow and keep boost and exhaust back pressure in-check. Taking full advantage of this design, the Stealth 64 has had some minor changes made to the wastegate system to allow better performance in a high horsepower application. While the turbo is shipped with the actuator pre-set for optimum boost levels as a single turbo, the adjustable end link does make the Stealth 64 a great option as a high pressure unit in a compound turbo system.



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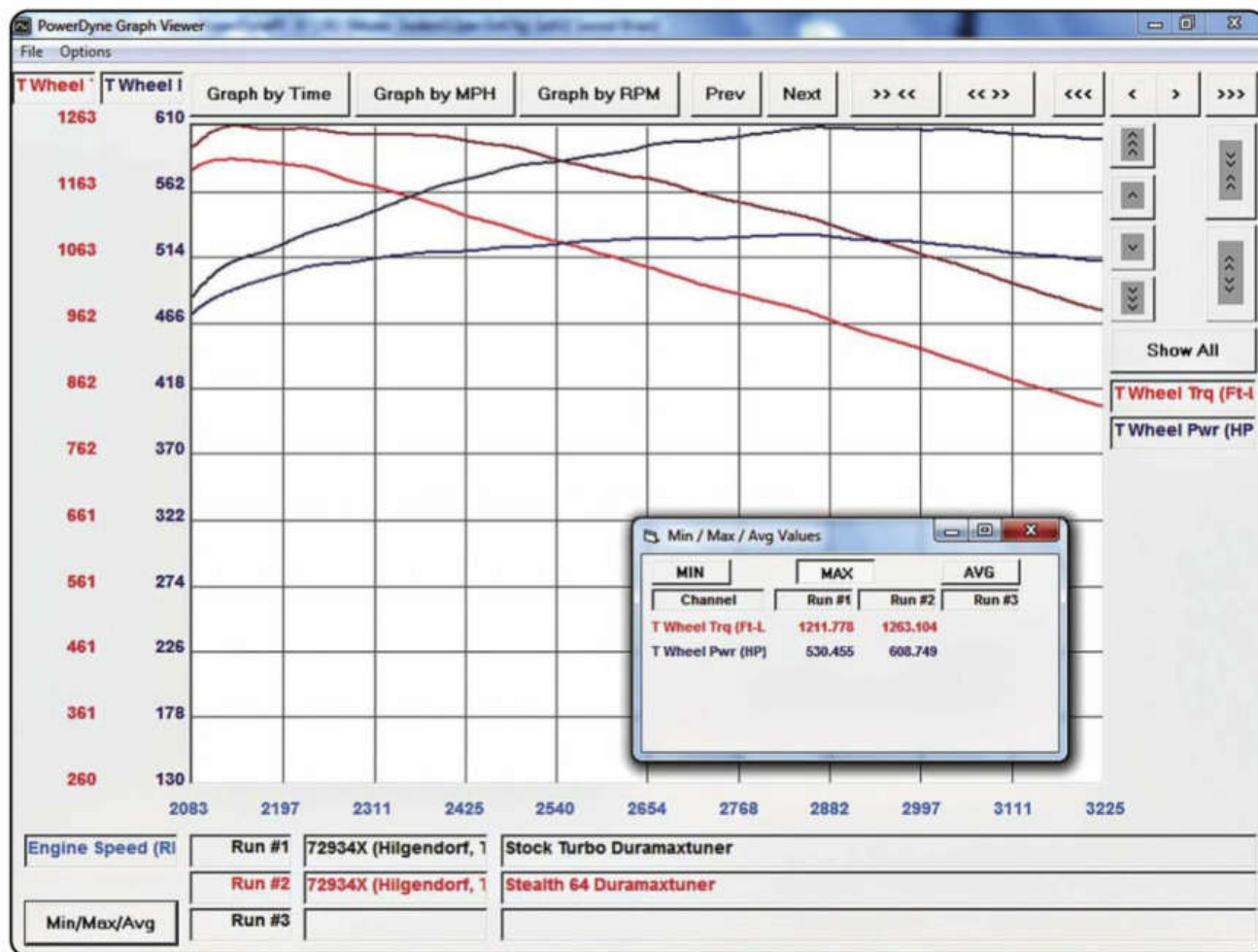
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9 While doing a turbocharger swap on LB7 trucks isn't a job for the faint of heart, due to its design being based off the stock turbo, the Stealth will drop right in place of the stock unit. Depending on the condition of the truck, this job can take anywhere from 4 to 8 hours. The exhaust downpipe and manifold up-pipe bolts that thread into the back of the turbine housing can be a bit stubborn and will take some patience to break loose and remove.



10 Once dropped into place, the Stealth 64 looks right at home in the engine valley, and to an untrained eye, it looks completely stock, especially once the intake system is bolted back on. The new compressor wheel offers a broad power and torque curve with a more pronounced whistle under the hood.



11 The in-house chassis dyno at Duramax Tuner was extremely useful when testing and developing the Stealth line of turbochargers. The final production unit has proven to support gains of over 80 hp above the stock turbocharger while helping to reduce EGTs and improve towing performance with a much flatter power curve. This dyno chart comes from a 2001 truck with a set of 30% injectors, healthy stock CP3, DT750 built Allison transmission, DT ECM/TCM tuning, high flow intake elbow, 3-inch downpipe and low pressure fuel lift pump. With no changes to the tuning at all, horsepower jumped from the stock turbos impressive 530 hp to almost 609 hp.

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12 & 13 Nick Priegnitz, the owner of Duramax Tuner, just completed this immaculate frame-off restoration of his 1958 Chevrolet Apache truck. Running an LB7 Duramax and ZF-6 manual transmission, the truck will see its fair share of sled pulling action running around the local circuit in the Work Stock class with the Stealth 64 under the hood.



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With the monstrous success of the Stealth 64 for the LB7 market, the clever Duramax Tuner crew has spent countless hours testing and developing an all new turbocharger to appease the 600-to-800-hp crowd, while maintaining that same factory drop-in style installation. Based off the durable Borg Warner S400 center section, Duramax Tuner's all new Stealth 67 will use a custom cast compressor cover with the 2004.5-2010 Duramax VGT v-band style inlet to allow easier fitment for all model year Duramax trucks. On the exhaust side, they've taken things to an all new level of performance and ease of fitment by creating, casting and machining an all new turbine housing from scratch. The all new turbine housing will allow the installation of the S400 style turbocharger without the need for an aftermarket pedestal, downpipe and charge air piping system. Using the same LB7 style downpipe flange, the internally gated housing will make for an easy install with great low-end response and the ultimate top end performance capable of supporting up to 800 hp. The Stealth 67 will also make a great base for a large compound kit that could support 1,100+hp depending on the fueling and larger atmos-



pheric turbocharger. The all new Stealth 67 has been tested on the street and dyno with quite a few sled pulls and drag strip passes under its belt as well. With a schedule market release for fall of 2015, keep an eye on DuramaxTuner.com and the company's social media pages for further information.

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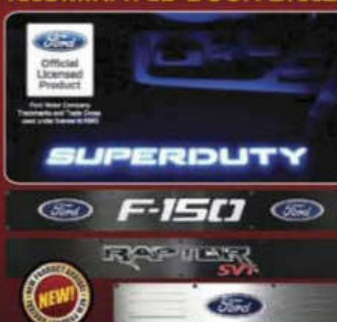


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TEXT BY TRENT RIDDLE
PHOTOS BY ADAM BLATTENBERG

Brett Williams is one of the VPs of Industrial Injection at Salt Lake City, Utah. If you haven't heard of the crew at Industrial Injection, they're one of the leading diesel performance experts in the industry today, and this story is about their VP's diesel, a Duramax drag truck. While it's not the first diesel he's ever driven, it's the first Duramax he's owned.





An A-pillar gauge mount houses ISSPRO gauges.

BACK UP

The story behind this truck is that the previous owner brought it into the shop for repair work. That owner then abandoned the rig, as the needed repairs were more than he wanted to spend. An offer was made, and a project was born.

Originally this 2001 was slated to be a shop truck, but on tear down it was discovered that the trouble went deeper than

just a new set of injectors. A broken head bolt made it clear that the engine needed to get pulled. One thing lead to another and this former daily driver was on its path of transformation.

METAMORPHOSIS

The first order of business was performing a full race build on the engine. This included a Winburg billet crank,



The turbo system is a custom setup with Industrial Injection S480/S510 compound turbo combo.



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The stock rear end is retained, but a Grizzly locker was installed, and a Mag Hi-Tech cover allows for more oil and better cooling. A pair of FASS 260 gmp pumps feed the fuel to the triple CP3 pumps that feed the engine.



The current 6.6L Duramax features a Winburg billet crank, Carillo rods, forged pistons and is blueprinted and balanced. Industrial Injection race ported heads and alternate firing order cam also help it make big power and survive. Notice the triple Dragon fire CP3 pumps at the front to feed fuel to this hungry monster.

THE STORY BEHIND THIS TRUCK IS THAT THE PREVIOUS OWNER BROUGHT IT INTO THE SHOP FOR REPAIR WORK. THAT OWNER THEN ABANDONED THE RIG, AS THE NEEDED REPAIRS WERE MORE THAN HE WANTED TO SPEND. AN OFFER WAS MADE TO BUY THE TRUCK, AND A PROJECT WAS BORN.

Carrillo Rods, forged pistons and some Industrial Injection ported heads and their alternate firing order camshaft. The engine was mated to a 48RE automatic conversion, and a Sun Coast torque converter with a 3,000 rpm stall speed was utilized; a Precision air shifter was added to control the gear selection.

On the body side, the original 2001 extended cab was retained, but it was stripped of everything but the dash. A cage from Rollover Motorsports was installed, as well as a set of Corbeau seats with 5-point belts. The bed was also removed, but the truck retained its original look, with a set of fiberglass bed sides. Other weight-saving measures include the use of a fiberglass hood and front fenders.



To lighten the truck, the interior was stripped out. A cage from Rollover Motorsports was installed for safety. The stock seats were replaced with a pair of Corbeau seats with 5-point belts.

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Other upgrades to the suspension and driveline include Rancho 9000 shocks, Stainless Steel Brakes Tri-Power brake setup, Yukon Grizzly rear locker, Cal Trac traction bars, PPE Center Link, Cognito front A-arms, Flex-a-Lite cooling fans and Twin FASS 260 GPM lift pumps. On the fuel side, the team also installed triple Dragon Fire injection pumps, Cobre 1100 cc injectors, and a Nitros Express system NO2 system. The tuning is handled with an Edge CST with ESA data logger and EFI live, and a custom tune was made by Starlite Diesel. On the exhaust side, we find PPE exhaust manifolds and up-pipes, with custom piping into the 5-inch MBPR hood stack.

HOW DOES IT STACK UP?

This truck pumps out an estimated 2,000 hp and 3,000 lb-ft at 5,000 rpm. (These figures are an estimation based on the diesel routinely maxing out the in-house dyno at Industrial Injection, these numbers being the highest they can accurately record.)

It took a little over three years to build, but it was worth the effort. Many helped Brett with the build: Dallas Hunt, Chavis Fryer and many of the Industrial Injection employees. Now the team can proudly kick back as the truck roars down the track, often racing competitively and stealing the win. With 158 mph as the top speed, ¼ mile ETs at a consistent 9.63 seconds, this truck is a winner. **DW**



The triple Dragon fire CP3 pumps at the front of the engine feed fuel to a distribution/accumulation block. The fuel is then passed on to the injectors to meet the engine's needs at full power.



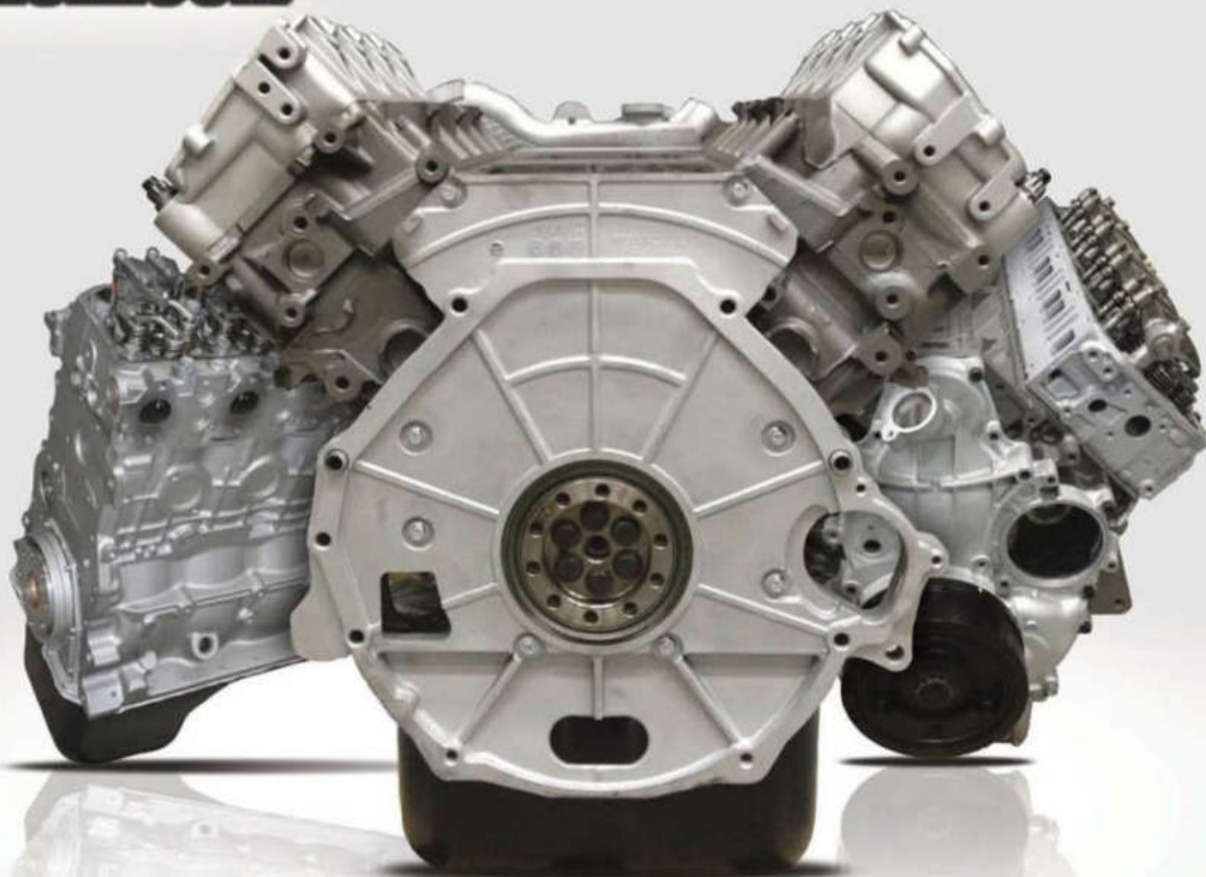
Between the frame rails, in the back of what was the bed space, you'll find a 15-gallon fuel cell, nitrous tank, transmission cooler with fan and the battery box. This weight is strategically placed over the rear axle to improve traction.



CalTracs traction bars are essential to reducing axle wrap and increasing traction. Of course, the race slicks are a big part of the traction equation too.

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Diesel Sellerz.com reveals its monstrous 6-door Mega RamRunner project truck.



CHASING 2,000 HP

*Northwest Dyno Circuit
Wants to Crown a King*

TEXT AND PHOTOS BY JACOB WHITE

On April 18, the newly formed Northwest Dyno Circuit (NWDC) held its second event hosted by No Zone Diesel in Orem, Utah. With dyno competitions becoming more and more popular around the northwestern states, the crew at Custom Auto of Idaho Falls, Indiana (owners and operators of the mobile Superflow Dyno) put together something special for the performance diesel scene. Organized much like a sled pulling club, the Northwest Dyno Circuit set some standardized rules for Stock Turbo, 6.4L Power Stroke, Modified Single Turbo, Compound Turbo, and Unlimited classes to keep an even playing field for everyone involved. 25 sanctioned events were created to help score with the goal of eventually crowning a season champion in each of the five classes. And a new sport was born.

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RECAP

With talk this year that someone will break the Fuel Only 2,000 hp mark on the chassis dyno, the excitement and suspense filled the air early morning as the team from Industrial Injection unloaded their nasty purpose-built Duramax race truck. With multiple 1,800 hp runs already under its belt and "going for broke" talk coming from the Industrial camp, everyone had high hopes of this being the day 2,000 hp would be surpassed. Unfortunately, after two years of unbelievable abuse on the track and on the dyno, the fully built engine finally let loose from what appeared to be a connecting rod failure during the first hard pull.



This unique LB7 Duramax came all the way from Aztec, New Mexico, to try its luck in the single turbo class. Owned by Roberto Gonzalez, the remote mounted turbocharger and dual CP3 setup rolled the dyno to the tune of 687 hp...good enough for a second place trophy.



As the first stop on the new Northwest Dyno Circuit's 2015 schedule, the No Zone Diesel event brought out a great crowd and long list of dyno entries.



The Duramax powered Industrial Injection race truck was built for a couple reasons, first and foremost, product development; second, to break records and third, to help market those same record breaking products being developed. With virtually anything and everything you can do to a Duramax power plant bolted to this thing, those giant turbos, triple CP3s and giant Cobra injectors have already done north of 1,800 hp on the chassis dyno. Thus, the quest for 2,000 hp continues.



Verlon Southwick of Shoshone, Indiana, made the drive down to test his luck in the compound turbo class.

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Just as the truck really started to hit its peak RPM range and the power curve was climbing past 1,400 hp, some rather noticeable clattering and banging came from within the engine and a windowed engine block led to coolant and engine oil dumping out all over the deck of the dyno. Surprisingly enough, even with the early breakage, its 1,457 hp run was enough to take home top honors on the day. In a close second place, was another Duramax powered race truck, built by Husker Diesel who drove clear from Nebraska to attend the

"WITH MULTIPLE 1,800 HP RUNS ALREADY UNDER ITS BELT AND 'GOING FOR BROKE' TALK COMING FROM THE INDUSTRIAL CAMP, EVERYONE HAD HIGH HOPES OF THIS BEING THE DAY 2,000 HP WOULD BE SURPASSED"

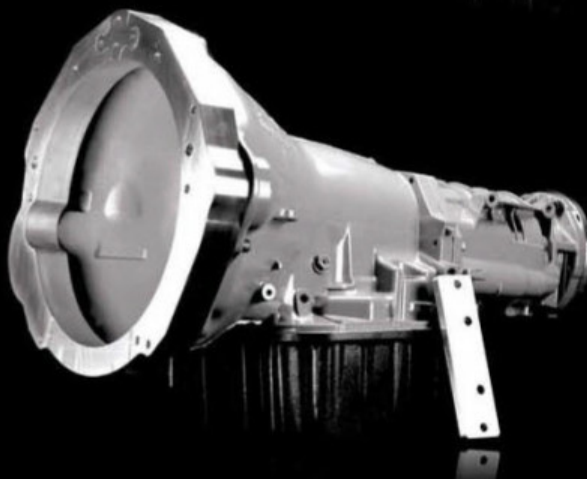
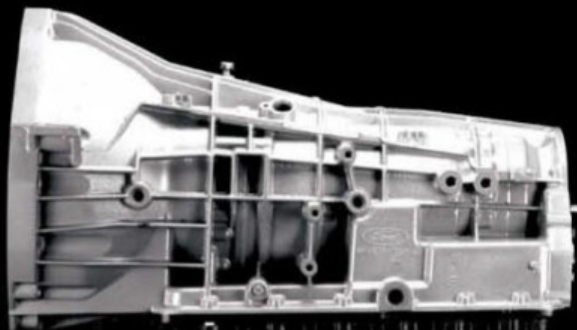


Nestled into a small industrial business park just off the I-15 corridor in Orem, UT, the No Zone Diesel shop is owned and run by Dmitri Millard, a name that should be pretty familiar with anyone that follows the high performance diesel market. Millard has been pushing the limits of Duramax performance for years now and has most recently branched out into building competition Allison transmissions for Duramax owners all over the country.



Dan Madden had an unfortunate run-in with a cement barrier in his 'Cat-a-Max' Duramax last season at a Diesel Motorsports' dirt drag event when he couldn't quite get the truck stopped in time. But it appears that it's back with vengeance and ready for more. 901 hp was enough for a fourth place finish in the compound turbo class.

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event. Justin Hyatt, owner and builder of the truck, was able to take home the win in the fuel only Compound Turbo class with 1,452 asphalt shredding horsepower. Second place in the Compound class went to Zach Fuller of Starlite Diesel Tuning in his crew cab dually LLY Duramax with a 1,154 hp run.

In the Modified Single Turbo class, Duramax trucks once again would dominate with Robert Posey's 2001 putting down 721 hp and Roberto Gonzalez' 2003 managing to put down 687 hp. Running in a class of their own for the NWDC 2015 season, 6.4L Power Stroke owners went head to head due to their so called "advantage" in a Stock class thanks to their factory compound turbo system. The No Zone Diesel event only brought out one 6.4L, the 704 hp



Some may remember the carnage that rained down throughout the 2014 dyno season from Dmitri Millard's red Duramax. As a product test bed continuously being pushed to its limits, the big GT55 single turbo'd truck definitely went through some parts. Now showcased as badges of honor at the No Zone shop, parts like these are just some of the unexpected casualties from the search for 2,000 hp.



Joey Leeper's clean 2002 24V stock turbo Cummins put down a respectable 378 hp.



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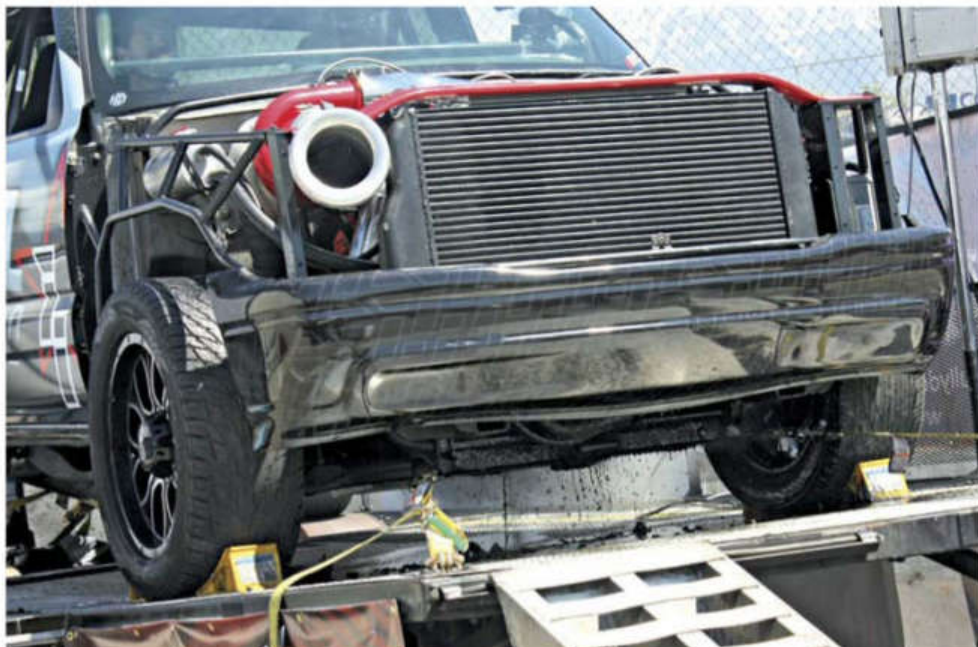


sleeper owned by Justin Tyler of Ogden, UT. In the Stock Turbo class, there were over 20 entries with top honors going out to Jeremy Schraeder's LB7 powered Duramax with 529 hp. A 2014 Dodge Cummins landed second with 527 hp and Weston Youd's 2003 compressed natural gas powered Duramax with 518 hp.

As an Exhibition run, Diesel Dave of Diesel Sellerz.com had his giant 2012 6-door Dodge Mega Ram runner up on the dyno to prove that his 6.7L Cummins could still get almost 600 hp to the ground through monstrous military style axles and 40+ inch tall tires. Managing Director for the Northwest Dyno Circuit, Brandon Pierce, told us they were extremely pleased with the 40+ entries they had roll across the dyno, along with the hundreds of spectators in the crowd throughout the day. As this was the second event held by No Zone Diesel, they more than doubled the turnout in just one year's time—thanks to the help of the newly formed NWDC and advanced marketing strategies. Dmitri Millard, owner of No Zone Diesel was broken hearted since he didn't have his

beloved truck 'Katrina' quite ready for the event but promised us it would be ready for the Industrial Injection dyno event. With 25 more dyno events already

scheduled for the season, it appears that the NWDC and No Zone Diesel crew kicked the season off right. And the quest to crack 2,000 hp continues. **DW**



After dozens of 1500+ horsepower runs on the dyno, multiple 9-second passes at the track, and who knows how much nitrous, the billet connecting rods came apart, which led to a windowed engine block and the massive evacuation of the engines oil and coolant all over the dyno.

This super clean 4th Gen 6.7L Cummins was sporting a brand new S465 turbo under the hood with a clean 2nd Gen style T4 turbo conversion kit. Still running stock injectors, the combo appeared to make a great daily driver and towing setup with plenty of power on tap.



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RESULTS:

Stock

Jeremy Schrader	2003 Duramax	529
Ian Vaske	2014 Cummins	527
Weston Youd	2003 Duramax	518
Court Hale	2003 Duramax	505
Logan Kraalima	2005 Duramax	503
Jesus Mendoza	2009 Cummins	497
Irvin Quezdada	2001 Duramax	492
Ryan Cook	2004 Duramax	487
Kody Pulliam	2002 Duramax	476
Julio Lara	2007 Duramax	475
Weston Youd	2015 Duramax	468
Roberto Gonzalez	2014 Duramax	468
KC Hopins	1998 Cummins	464
Cleve Martin	2005 Duramax	460
Kolton Kellogg	2004 Duramax	450
Rory Murnao	2006 Duramax	430
Joey Leeper	2002 Cummins	378
William Burnett	2006 Cummins	356
Cody Bott	1999 Power Stroke	332
Andrew Kaplan	2005 Power Stroke	321

6.4 Power Stroke

Justin Tyler	2010 Power Stroke	704
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Modified Single Turbo

Robert Posey	2001 Duramax	721
Roberto Gonzalez	2003 Duramax	687
Caden Knight	2007 Duramax	666
Taylor Faulkner	1998 Cummins	600
Cody Daley	2005 Cummins	534
Kolton Peavler	1996 Cummins	516
Tyler Murphy	2001 Cummins	457
Wyatt Williams	1994 Cummins	369
Jonathan Walker	2012 Cummins	333

Compound Turbo

Justin Hyatt	2003 Duramax	1452
Zach Fuller	2005 Duramax	1164
Scott Archibald	1999 Cummins	946
Dan Madden	2003 Duramax	901
Mike Mikstas	2005 Duramax	875
Verlon Southwick	2006 Duramax	874
Lyle Richmond	2006 Cummins	842
Justin Archibald	2006 Cummins	749
Jereme Smith	2005 Cummins	713
Mike Tripp	2007 Duramax	605
Jessie Sanchez	2004 Duramax	566

Unlimited

Dustin Hembury	2001 Duramax	1457
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Exhibition

Diesel Sellerz	2012 Cummins	594
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"IN THE MODIFIED SINGLE TURBO CLASS, DURAMAX TRUCKS ONCE AGAIN WOULD DOMINATE WITH ROBERT POSEY'S 2001 PUTTING DOWN 721 HP AND ROBERTO GONZALEZ' 2003 MANAGING TO PUT DOWN 687 HP"



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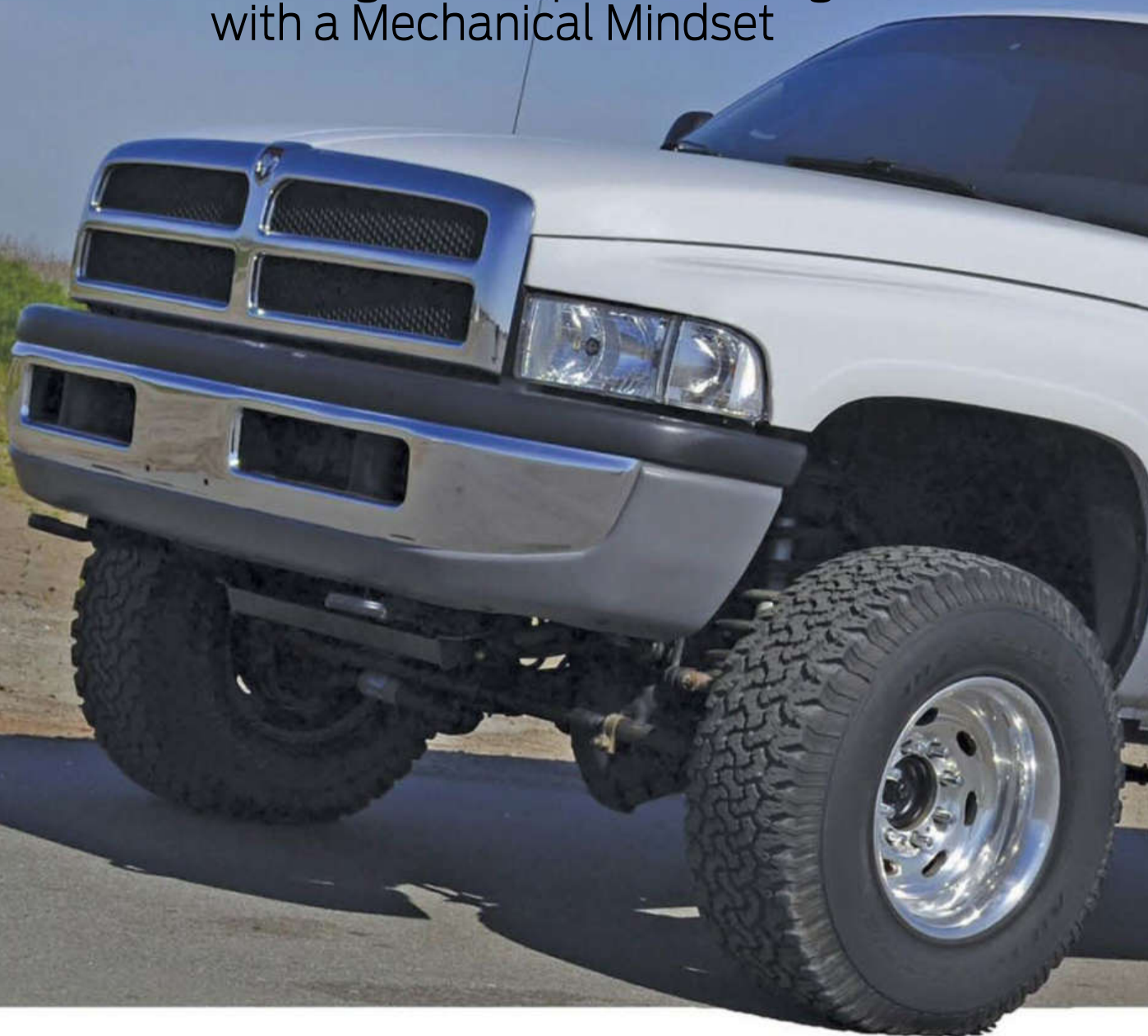
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AST

BY JASON SANDS
PHOTOS BY JASON SANDS

For years, 12-valve Dodges built between 1994 and 1998 have enjoyed a healthy following in the aftermarket, as have '03 and up common-rail trucks. Stuck in the middle ('98.5-'02) are the VP44 rotary-pumped Dodges, which are both fuel and rpm limited. Still, there are a brave few who take the road less traveled, and build these underrated rigs, like Casey Dixon of Hollister, California. With the help of his Dad Doug, who owns Compulsive Motorsports, Casey put together a simple single turbo combination that can run with the best of them, no matter what year his competition may be.





Not only does Casey's engine produce an estimated 750 rear-wheel horsepower, it's virtually immaculate. It also has a bit more color than we're used to seeing, which was a nice surprise when he popped the hood.



A single 67.7mm turbocharger from BorgWarner is responsible for making more than 60 psi of boost. Exhaust exits via an HX40-style 4-inch downpipe, which connects to a 5-inch MBRP exhaust.

BACKWARDS THINKING

Even though Casey's '99 Dodge is extremely clean, the engine still had more than 200,000 miles on it, so Casey went with the extra insurance of installing ARP head studs, to prevent any head gasket issues on the high mileage engine. Casey want' done upgrading the 5.9L Cummins short block: While the engine was part, he also installed a hot street camshaft from Hamilton Cams, along with the company's HD pushrods and 103-pound valvesprings.

When it comes to making power, many VP44 enthusiasts will just put as many boxes and programmers on the engine as they can, and crank them all the way up. This usually creates a smoky mess of a truck, which has both way too much timing and duration to run right. Casey however, had a different approach. He decided to leave the electronics alone, using an Edge only so the truck wouldn't throw a boost code. To bump up the fuel side of things, Casey replaced the stock injectors with some "big" race injectors from Scheid Diesel. Scheid also



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Casey was pretty tight-lipped about injector specs, but he did share that the Scheid-built sticks were much, much bigger than stock. A set of oversize 0.093-inch lines rounds out the combination.



A 165 gallon-per-hour lift pump supports the 5.9L Cummins. Mounted low along the frame, the aftermarket lift pump was needed to support the rest of the Dodge's hopped-up injection system.



A set of 3.73 gears help keep the Dodge in its powerband at the track. Bilstein shocks help with dampening on both the track and the street.

the OUTCAST

provided one of their competition VP44 pumps, and 0.093-inch injection lines.

INDUCTION DUTIES

From the intake, to the turbocharger, to the exhaust, everything in the airflow path on Casey's engine has been either massaged or replaced. The intake is a large universal oiled unit from AFE, which uses a 45-degree boot to feed a 67.7mm S400 turbocharger with a polished cover. The turbo is connected to the engine via a Stainless Diesel exhaust manifold, and air is expelled with a simple HX40-style 4-inch downpipe. Air on the compressor side is forced through a stock intercooler, before it enters a high-flowing Banks Monster-Ram, and then into the engine. Casey was unsure of how much boost the combination pushes, as he can currently peg his 60 psi boost gauge.

KEEPING IT ON THE ROAD

With enough air and fuel to make an estimated 750 rear-wheel horsepower, the rest of the Ram's drivetrain needed a few upgrades as well. Since Casey was



A large oiled universal AFE air filter was incorporated into the build, which flows more than enough air to support the hungry BorgWarner turbocharger.



In addition to the intake and exhaust upgrades, airflow into the engine has been improved as well, with the addition of a Banks Monster-Ram intake horn.



Although it might look like a normal VP44 pump, the Scheid Diesel-built VP44 flows a much greater amount of fuel than a stock unit. While the factory VP44's are limited to around 600 rwhp (without nitrous) the Scheid pump makes close to 750 rwhp based upon trap speed.



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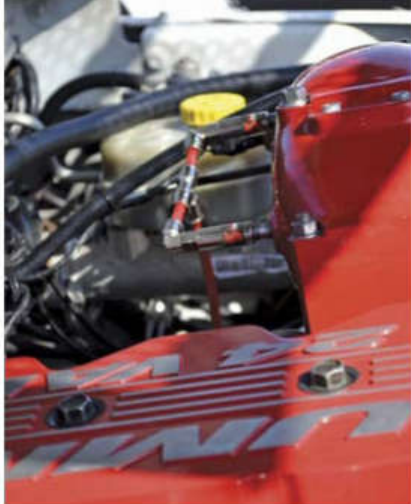
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Right before we shot the Dodge, Casey installed a Snow Performance water-methanol kit to try and calm down the truck's 1,700 degree exhaust gas temperatures. Unfortunately, he didn't get much time to play with it before the truck's turbo checked out.



For reliability reasons, the stock exhaust manifold was replaced with this unit from Stainless Diesel, which is not only stronger, but flows more than the factory version.

**"CASEY'S
BEST
QUARTER-
MILE TIME
HAS BEEN
11.72
SECONDS
AT A
BLAZING
118 MPH"**

looking to drag race regularly, his transmission received the full treatment, and was completely rebuilt by Brown's Diesel in Riverdale, California. Brown's upgraded all three shafts (input, intermediate, and output) with aftermarket units, added a Goerend valvebody, and a special high-stall triple-disc converter to match the turbocharger. The suspension and steering was also upgraded, as "death wobble" at 120 mph wasn't on the menu. Up front, a BD track bar and steering box stabilizer keeps everything solid, while CCP traction bars in the back help plant the rearend.

At the time we went to press, Casey's best quarter-mile time has been 11.72 seconds at a blazing 118 mph, on a pass where he unfortunately grenaded his 67.7mm turbo. Not one to be deterred from going faster, he's already looking at a ported head from Scheid Diesel, an intercooler, and an upgraded turbo setup. While the VP44 platform may be the Black Sheep of the Dodge world, what Casey has done with his '99 has set him firmly apart (and ahead of) the rest of the rotary pump pack. **DW**



With more than triple the factory horsepower rating, an extremely stout transmission was needed to handle the estimated 750 rwhp and 1,300lb-ft of torque that the modified engine produces. Built by Brown's Diesel in Riverdale, California, the 47RE transmission has upgraded input, output, and intermediate shafts, a Goerend valvebody, and custom high-stall converter. An upgraded flexplate from Goerend attaches the transmission to the 5.9L engine.



We saw proof of Casey's power at Famoso, CA, where his goal was to break into the '11s. After running a maddening 12.00-second pass, he later went back to the strip and clicked off a best of 11.72 at 118 mph.

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Carli Suspension Upgrade Helps Work and Play

TEXT BY TRENT RIDDLE
PHOTOS BY TRENT RIDDLE
AND COURTESY OF CARLI SUSPENSION

In stock trim, the F-250 4x4 is a good work truck. If you get one with the factory FX4 package, it brings you skid plates for the transfer case, fuel tank, Hill Descent Control and Rancho shocks. However, it's still a work truck and rides like a heavy-service vehicle on pavement and off.

A Carli Suspension lift doesn't only raise the stance of your rig; it improves the ride under all driving conditions. The smoother ride and bolder look doesn't sacrifice any of the truck's work capacity: It just makes it more fun and comfort-

able to drive. Carli offers both components and full kits. The two basic lift heights are 2.5-inch and 4.5-inch. We stopped in and followed along while the Carli crew upgraded a new F-250 with the Dominator 3.0/4.5-inch lift. This kit has everything and



Seen here is a stock F-250 (L). Here's the same truck with a Carli Suspension Dominator 3.0 kit (R).



1 Here you see the front components of the Ford F-250 lift in these pages. This is the full Dominator 3.0, 4.5-inch lift setup. The front upgrade included new King remote reservoir shocks, longer springs, new front coils, coil buckets and much more.

a bag of tricks; installing it takes some time, but the end result is a truck that rides more like a sedan than any factory rig, and it eats up bumps with ease.

Follow along, and we'll show you the highlights of the install and some shots of the truck's capabilities after the Carli kit gets installed. **DW**



2 Installation at the front begins with raising the truck and then removing the stock components. Here you see the front upper coil bucket and shock mount brackets being removed. The OEM rivets must be cut off; an air chisel works best for this.





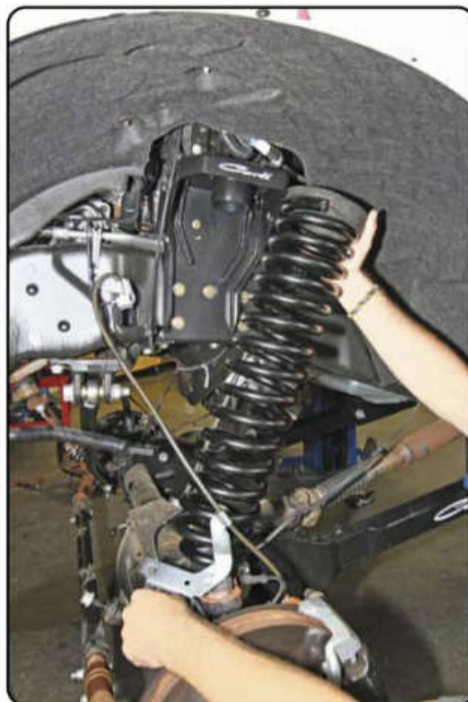
3 Note the OEM upper spring and shock bracket (L) compared to the new Carli unit. While similar in look, the Carli bracket allows the use of longer coils and shocks.



4 The OEM front spring and shock (L) are seen here, compared to the longer Carli springs and remote reservoir shocks.



5 Once the OEM upper spring and shock bracket is removed, the new Carli bracket bolts into the same holes the stock rivets were in.



6 Longer, braided stainless steel brake lines are installed and then the new, longer front coils are put in place.



7 With the longer coils in place, the front King remote reservoir shocks are installed. This combination will ride smoother and have more travel, offering your rig more tire and trail clearance.



8 Before the new Carli front suspension arms can be installed, the drop down bracket must be installed on the frame.



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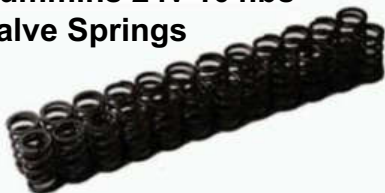
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7 Here you see the completed front installation of the Carli 3.0 Dominator kit on our Ford F-250. It's a clean, rugged and functional system that is far superior to the stock setup for ride quality, height and added travel for rutted roads and trail.



10 As with the front, the stock shocks are replaced with larger and longer coil-over shocks from King. Carli has their shocks custom made to fit each application, after hours of tuning on a wide range of driving surfaces. This ensures the best ride possible.



8 Here is a comparison of the OEM rear spring and the new Deaver springs in the Carli Kit. The new rear leaf springs are a multi-leaf design that rides better under virtually all conditions.



9 The rear springs are heavy, and it is best to have help when removing the OEM pack, especially when reinstalling the new and thicker pack in the Carli kit.



11 Here you see the new Carli rear shock mount (L) compared to the OEM mount. The OEM mount must be cut off the frame since it is riveted.



12 Seen here is one of the two new rear shock mounts, now bolted to the frame using the OEM brackets' rivet holes.

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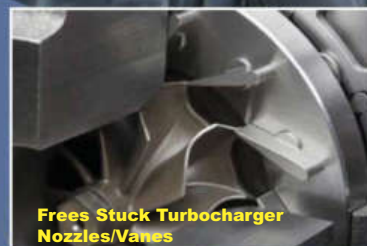
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13 With the new remote reservoir shock installed, the rear air bags can be installed. These air bags add the extra carrying capacity needed to level the truck at max OEM load. This is an upgrade to the basic suspension kit, but well worth it on any truck that often carries heavy or tows with big trailers.



14 This view shows the flexibility of the Carli suspension on the Ford F-250 4x4.



15 On the opposite side, you can see just how much "up-travel" the Carli kit offers. This 37-inch tall tire is stuffed into the wheel opening, with just enough clearance to prevent grabbing the wheel openings. This size tire won't even fit on the truck, with the OEM suspension; here it fits even with the suspension flexed out.



16 This Toyo Open Country AT 37x13.5R20LT fills the rear wheel opening and looks cool mounted on a Fuel 20x9 Octane wheel. Here the suspension on this side is against the rear bump stops. At normal ride height, there's even more clearance around this huge tire.

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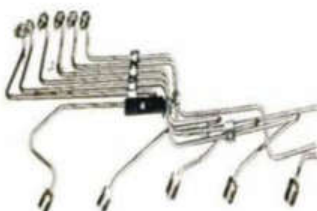
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Duramax CP3 Technology

With Fleece Performance

TEXT BY JACOB WHITE
PHOTOS BY JACOB WHITE
AND FLEECE PERFORMANCE

The Bosch CP3 injection pump has been used in the Duramax application since its introduction in 2001 and has since proved to be the go-to injection system for the light duty diesel market. Whether it be a stock daily driver/towing application or high performance sled pull/drag race truck, the Common Rail injection system with a dual CP3 setup is just hard to beat. Due to the CP3's ability to supply extreme rail pressures (26,000 psi or more) and its ease of tenability, the CP3 technology continues to evolve and take diesel performance to heights never thought possible with electronic injection.

BASIC OPERATION PRINCIPLES

Not only was the CP3 used on the Duramax engines from 2001-2010, the Dodge Cummins has been using its common rail technology since 2003. The radial three piston design is gear driven off the engine. Obviously, its main purpose is to create high pressure for the fuel rail, which feeds fuel to the individual injectors. Since the engine's computer and the injectors are doing most of the work when it comes to injection timing and injection rate, basically all the CP3 is required to do is supply a commanded fuel pressure to the rail system based off the ECM's calculated need. The internals of the pump work much like a basic engine does, with a rotating assembly in the middle of the pump body; an offset lobe on the shaft moves each of the three pistons up and down to create pressure within their respective cylinder; this motion creates the extreme pressurization of the fuel which is then fed into the fuel rail. The injection pump uses electronics and a Fuel Control Actuator (FCA) to regulate this pressure and increase volume and pressure as requested. Since an engine will need less volume and pressure at idle than it would under a heavy wide-open throttle run, the pressure regulator is key to a proper functioning CP3.

MODIFICATIONS

Since the CP3 pump was engineered to supply fuel to a stock engine at 360 hp, in most applications, once you've surpassed the 500-hp mark, the factory CP3 just can't supply the



required volume of fuel to maintain the requested fuel rail pressure. To overcome these limitations, Fleece Performance of Brownsburg, Indiana, developed all new internals to replace the factory pieces that not only increase the flow of Bosch CP3 but improve its strength and durability from higher horsepower and high-pressure applications. Since the pumps have to be able to withstand a higher side load from the rotational stresses, the internal camshaft is designed and machined completely in-house on state-of-the-art equipment. Fleece is currently offering two versions of the Bosch CP3: the CP3K which is a perfect stock replacement (with internal modifications made to remove the fuel restriction at 3,000+rpm) the PowerFlo 750 uses a 10mm stroke, which bumps volume up enough to support 750 rwhp without rail pressure drop under hard load.

To gain better understanding of the science behind the CP3 injection pump and what the aftermarket is doing to improve their performance potential, a quick Q&A session with Brayden Fleece and Jeff Merriam of Fleece Performance should help you grasp the latest on CP3 technology.

While this article is based solely off the Duramax product line, Fleece also offers a complete line of modified replacement pumps for the 5.9L and 6.7L Cummins applications, and the science and engineering within these pumps will be virtually identical.

CONVERSATION WITH BRAYDEN FLEECE AND JEFF MERRIAM

Q: What exactly does the CP3 injection pump do?

A: "A common rail fuel system is most easily related to the economics theory of supply and demand. The commanded main

fuel injection duration is the "demand," while the CP3 pump is the "supply." As the injector size gets bigger and/or the commanded fuel duration gets longer (more demand) the higher the supply is going to need to be. The factory CP3s are limited to what they can supply volume wise, mostly based on displacement and engine rpm. As the demand increases beyond the CP3s ability to maintain supply, fuel rail pressure will start to drop.

Q: When the OEM stock CP3 starts getting weak and won't maintain rail pressure and/or fails, what are the advantages to running the modified CP3K over a complete stock replacement pump?

A: The Fleece Performance CP3K is a brand new Bosch pump that is modified to eliminate the factory fuel flow restriction that begins at 3000 rpm. The stock CP3 will start losing fuel flow and



1 The Fleece Performance PowerFlo CP3 is a straightforward, no-inflated-numbers CP3 upgrade proven to support 750 RWHP with the proper complimentary modifications. Not only will it support 750 rwhp, but it also eliminates the factory fuel flow restriction that begins at 3,000 rpm.



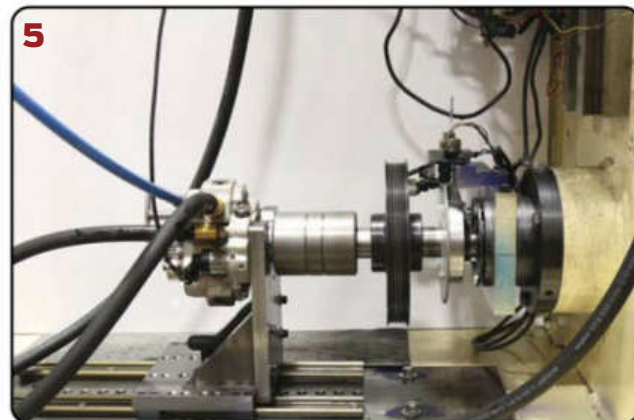
2 While the PowerFlo 750 CP3 injection pumps are built using brand new Bosch injection pumps, there are multiple modifications made within the pump to increase the volume of fuel flow available. The most important piece to this puzzle is the in-house machined center shaft that the plungers will ride on: Much like the camshaft of an engine, the profile on this "cam" is key to proper flow and maximum rail pressure.



3 Running on state of the art CNC equipment, all pieces made by Fleece Performance go through strict quality control checks to ensure that each pump built and shipped will perform as good or better than advertised.



4 Once completed on the CNC lathe, the internal cam can be installed into the Bosch CP3 pump where its 10mm additional stroke will aid in the pumps ability to supply the required fuel to the injectors to surpass the factory pumps horsepower potential. The PowerFlo 750 has been proven to support a true 750 rwhp should your supporting modifications and turbocharger be sufficient to do so.



5 & 6 To ensure each pump will perform to its maximum and advertised potential, they are placed inside the Common Rail Engine simulator and test stand that are designed by Fleece Performance. Running an LBZ Duramax ECM and injectors with FPE 60% nozzles, they can demand main injection duration used in high horsepower applications to recreate real world conditions and put the pumps through their paces to guarantee rail pressure drop will be a thing of the past.

rail pressure after 3000 rpm. This decrease in flow and pressure will correlate to power loss when you may need it the most. This CP3K is a cost effective upgrade that will allow you to maintain desired fuel rail pressure clear to the red line.

Q: What is Main Injection Duration?

A: Main Injection Duration is the amount of time that the injector is turned on or energized. Measured in microseconds (mcs) it is sometimes referred to as pulse width. Basically, this is the command from the computer telling the injector how long it needs to be open and injecting fuel into the cylinder.

Q: What size injectors can be run with each of your CP3 upgrade options?

A: Injector size should be based off your desired horsepower goals: The truck uses overall tuning capabilities. The commanded



7 The PowerFlo 750 injection pumps have become quite the hot ticket item for Fleece Performance.



8 The CP3 test stand is an invaluable piece of data equipment that maintains the highest quality standards. With an Airdog 150 lift pump supplying fuel pressure to the CP3s and a complete LBZ ECM and injectors being used, testing on this stand is as close to real world as it gets.



9 The Fleece CP3K and PowerFlo 750 injection pumps are available for 2001-2010 trucks as direct fit replacements to the OEM pumps. Because the LBZ model regulator offers the best overall performance from the CP3, they are used on all modified pumps, so LB7 and LLY trucks may require custom tune adjustments to ensure proper idle and run quality.



10 The Fleece LML CP3 conversion kit includes everything required to convert the 2011-2015 CP4 equipped trucks over to the higher flowing CP3 injection pump. By converting the later model trucks back to the earlier CP3, 750+ horsepower goals will no longer be an issue.

main injection duration or tuning ultimately determines what size injector a CP3 will support. Our PowerFlo 750 will support our 100-hp injector at 2,600 mcs with no issue, resulting in over 750 rwhp (given you have the supporting mods and turbocharger to support it). Some customers have even seen 800 rwhp with shorter durations and larger injectors on the Fleece 68mm turbocharger.

Q: The CP3 was used in the 2001-2010 Duramax. Why the big change from GM to the newer CP4 pump found on the 2011-2015 LML application?

A: The CP4 was introduced mostly as a cost reduction for the LML platform. With its more efficient piezoelectric injectors, a smaller amount of fuel is required to accomplish factory horsepower/torque demand, so the CP3 was not needed.

Q: If the LML requires less fuel demand, what were the reasons behind Fleece developing a CP3 Conversion kit for the 2011-2015 trucks?

A: Unfortunately, since its introduction, the CP4 pump has proven to be less reliable and much less capable than the CP3 system used in previous Duramax platforms. While sufficient in a stock application, the CP4 will only support around 500 rwhp. At that point, it just can't move the volume of fuel required to push power any further. Converting over to the earlier CP3 design can help take performance even further. Due to the efficiency of the injectors in the LML, a stock CP3 that could only make 550 hp in a 2001-2010 truck should have no problem supporting 600+ rwhp. This jump in performance potential also carries over to the PowerFlo 750 where it has made over 800 rwhp in multiple LML trucks. **DW**

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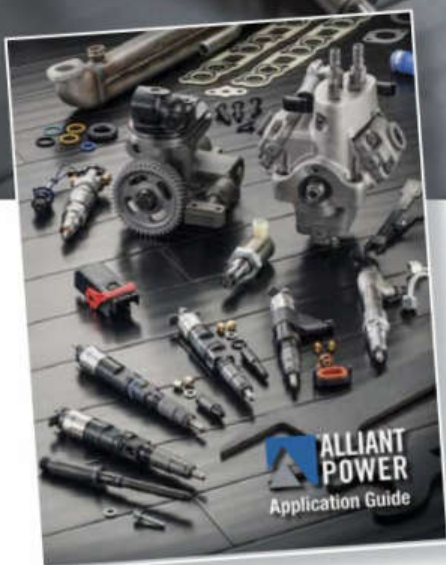
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The 4520

John Deere's First Turbo Diesel Tractor

BY JIM ALLEN

Allis Chalmers had been the first with a production turbo diesel tractor, the D19, in 1961. The result was appreciated and admired, but the other tractor manufacturers took their time developing their own turbo-diesel tractors. They, and perhaps the American farmer, still had a preference for big-displacement, slow-turning, naturally aspirated diesels when they needed more power. Some of the diesel designs still in use in the '60s didn't lend themselves to turbocharging. That wasn't true of John Deere.

THE WORLD OF DIESEL- POWERED TRACTORS

Deere had left the last of their two-cylinder legacy powerplants behind in 1960 and debuted a series of modern four- and six-cylinder inline engines. In the six-cylinder line, the '60 4010 and 5010 used 381- and 531-cubic inch engines. When the 4010 became the 4020 in 1963, the 381 six was given a displacement

boost to 404 cubic inches: The stage was set for a new tractor.

John Deere was a company that generally did not allow itself to be rushed into putting new developments on the market before they were ready. In fact, they had benefitted when other companies had done so. While some may have clucked a little about Deere

being a little behind the others in offering a turbo diesel tractor, the folks at Deere were confident they had not stepped on their crank when they finally did.

The 4520 debuted for the '69 model year as the company's first turbocharged diesel tractor. It fit between the very popular naturally aspirated 4020 and the



Adam and Bernie English's 4520 is still a working tractor. It's a Synchro-Shift model, meaning the final drive is all gear driven. The last four gears in the transmission are synchronized for easier shifting. The 4520 was heavier and stronger than its little brother, the 4020, and nearly as burly as the big brother in the lineup, the 5020. You could call it a "three bears" just-right tractor. Turbo-Built indeed!



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The Deere 404-six became legendary for its durability and adaptability. It started life as a 381-cid six in 1960. A bore increase of just 1/8-inch made it a 404. The 4520 was its first chance at turbocharging and the 404 engine proved as reliable in that venue as it was naturally aspirated. It lasted through 1982 in both NA, turbo and turbo aftercooled form, cranking out as much as 150 hp. It upgraded into the similar 466 (not to be confused with the International 466) with a full 1/4-inch bore increase and other improvements. The English's tractor does not use the funky and troublesome air filter that caused so much angst when the tractor debuted in 1969.

much larger 5020, with its 531 six-cylinder engine. Some have called the 4520 a "4020 on steroids" but that's not precisely true. It used a 404 engine that was based on the same NA engine used in the 4020,

but the power train and the tractor were larger and heavier. A more accurate description might be to call it a down-rated 5020 than an up-rated 4020. Unlike some of the other turbocharged tractors on the

market, the 4520 wasn't just a tractor to which a turbo was added. The entire package had been built around the extra power and John Deere used the ad line "Turbo-Built."



Despite having the same engine, the Synchro-Shift and Power-Shift 4520 tractors had different performance levels. PTO power was a fraction less in the Power-Shift test and it developed slightly less drawbar hp (108 vs. 111). Conversely, the Power-Shift developed dramatically more drawbar pull (10,079 vs. 8,773 lbs) while delivering just a skosh more fuel economy. The books say 7,894 4520 tractors were sold.

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By '69, the 404 six had become one of Deere's mainstays. It was and is a highly respected powerplant that many think was seminal in cementing JD's success in the '60s and '70s. The turbo 404 PTO power

output was a modest 122. The compression ratio was lower than the NA version (15.7:1 vs 16.5) with stronger pistons that used keystone rings and had up-rated piston oil cooling jets. The turbo engine had a

beefier new block with more main bearing support and improved oil flow.

Well, this turned out to be a place where J.D. might have tripped over its crank...or at least stumbled. It didn't take long for problems to start and dirt began being blown in the engine and in some cases setting the air filters on fire. J.D. had to pay for upgrades to customer's tractors even after the normal warranty was expired. Whoops! With an upgrade, the 4520 became a tractor to admire.

The 4520 was available with the standard Synchro-Shift or with the Power-Shift that offered clutchless shift-on-the-fly. It was one of the first tractors with a ROPS (rollover protection system) JD called "Roll-Gard." A heated and air conditioned cab was available as well as a fiberglass canopy that attached to the ROPS. Later in the run, a FWA system was offered as an option. Some of the last 4520s built in 1972 have been seen with the Sound-Gard cab that was one of the major contributors of the hoopla to Deere's "Generation II" program that started in 1972.

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The 4520 lasted into 1970 and was replaced in the line by the 4620, which was very similar but aftercooled and made 135 hp. The even more powerful 4630 of '73 made 150 hp with an intercooled 404 turbo engine. The 1973 model year was Deere's second new beginning, akin to its '60 rebirth, and the company debuted a great deal of new technology. Many say that the '73 Generation II era marks the beginning of John Deere's decades-long domination of the agricultural market. The 4520 was a major stepping-stone into that era. **DW**



The 4520 was fairly typical, but its control layout was particularly liked. A cab was available; this is a tractor you see often with a cab.

TYPICAL SPECIFICATIONS: 1969 John Deere 4520 Synchro-Shift

ENGINE:	404T six-cylinder inline, turbo diesel
DISPLACEMENT:	404 cid
BORE & STROKE:	4.25x4.75 inch
*RATED DRAWBAR POWER:	123.39 hp @ 2,200 rpm
COMPRESSION RATIO:	15.7:1
TRANSMISSION:	Eight-speed Synchro-Range (partially synchronized)
WEIGHT:	13,900 lbs
WHEELBASE:	106.5 inches
LXWXH:	170.75x95.9x87 inches
FUEL CAPACITY:	50 gallons
TIRES:	10.00-16 (others opt) 20.8-38 (others opt)
*FUEL CONSUMPTION:	7.9 gph @ full power
*DRAWBAR PULL:	8,773 lbs @ max ballast, 7.12% slip
*TOP SPEED:	18.3 mph

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Dodge Fans

Dear Jim,

I enjoy your magazine, and I read every issue cover to cover. I own a 2005 Dodge 2500 Heavy-Duty that I bought new. The truck currently has just over 100,000 miles and is used primarily as a commuter for my business. I haven't done any towing yet, but I do want to keep the door open to the possibility. Retirement is coming.

I love this truck and everything about it except for the 4-speed automatic transmission. I would like to install the newer 6-speed automatic that arrived in the 2007 model year, or learn about some of the other 6-speed automatics that would hold up to the rigors of towing.

Because I don't currently use the truck to tow, I was considering re-gearing the truck from 4.10s to 3.42s for better fuel economy. Would that make much of a difference? The truck is currently bone stock, but I am willing to install some modest modifications. Again, I am primarily interested in fuel economy, but I would prefer not to install the taller gearing if that takes towing off the table.

Lastly, I've heard that a Flex-a-Lite electric fan could improve fuel economy. What should I know about the fans to keep me from getting into trouble? I value your input.

Thank you,

Bruce Wender
Via the Internet

Bruce,

Thanks for reading. By replacing your 4.10 ratio with 3.42 gears, fuel economy will definitely increase, but your truck will lose some towing ability. The 3:42 ratio is a bit tall for towing heavy but will perform very well for everyday driving; also, you could keep your original 4-speed automatic if fuel economy is your goal.

Running 265/75R16 tires, 4.10 gears and a .75 overdrive ratio will produce approximately 2,286 rpm at 70 mph. Installing 3.42 gearing would reduce the engine speed to 1,907 rpm at 70 mph. Generally speaking, the closer to the engine's torque peak it's run, the better economy it will see. And I would expect a 2-4 mpg increase when switching from 4.10s to 3.42s depending on how you drive. However, if you tow heavy, you're better off with 4.10s, both from a power standpoint and a transmission longevity standpoint. Dodge preferred to install 4.10 gearing behind their 48RE automatic for durability reasons.

Years ago, I installed an overdrive automatic in a diesel pickup I owned at the time that had been running a non-overdrive 3-speed automatic. This coincided with the lifting of the 55-mph national speed limit. Having the overdrive made driving that truck a real pleasure. I could not hear the engine at freeway speeds, and fuel economy improved by nearly 5 mpg.

The principal advantage of the newer Aisen 6-speed is its double-overdrive, which lowers the engine speed while cruising at highway speeds, yet maintains the lower (numerically higher, like the 4.10s) differential gearing that is necessary for towing heavy.

Destroyed.com offers a variety of conversion kits for Dodge owners, including an installation package that allows installing an Allison 6-speed automatic behind the Dodge Cummins. They may also offer a similar package for the Aisen automatic.

Either 6-speed automatic would probably be an expensive and technically challenging upgrade – being an entirely custom installation, and you wouldn't likely recover the conversion cost by a small increase in fuel economy. Most people alter the gearing (via tire size and/or axle ratio) and then find a tuner that includes both an economy and a power tune, so the engine output could be optimized for how the truck is being used. That's what I would recommend—at least as a first step.

When compared to the engine-driven fan, electric fans improve fuel economy when they are not running. When on, they will consume some engine power due to more load on the alternator (a second alternator would be a wise upgrade when running electric fans). According to Flex-a-Lite, replacing the original engine-driven fan with an electric fan is not recommended for those trucks that run at 75% or more of their Gross Combined Vehicle Weight Rating. Electric fans are appreciated by truck owners living up north, who like the faster engine warm-ups. If towing is in your future, your original engine-driven fan will pull more air and provide better engine cooling. Deraile makes a line of improved viscous fan-clutches if you are looking to replace your original. Good luck.

6.5L Overheating

Howdy Jim,

I know GM's 6.5L diesel is now out of date, but my 1996 Suburban has been good to me and my family. We love the room and ride quality. I bought a mid-size travel trailer a couple of years back to allow my family a few weeks of vacation each summer, and I planned to tow that trailer with our trusted Suburban.

However, we soon experienced a lack of power and sometimes high engine temperatures that sometimes reached 220-230 degrees while pulling some of the longer/steeper hills. Now what temperature is considered too hot? What can we do to improve performance and lower the engine temperatures? I installed a new heavy-duty clutch fan on it and that helped some but was not a solution.

I was also wondering if I should be concerned about transmission temperatures while towing. The Suburban has 150,000 miles on it now, and a new fuel injection pump was installed a couple of years ago. It still runs and looks great because I try to take good care of it. I love my diesel Suburban, and any help you might offer would be great—also, your magazine is the best.

Thank you,

Howard Blanche
Newark, NJ

Howard,

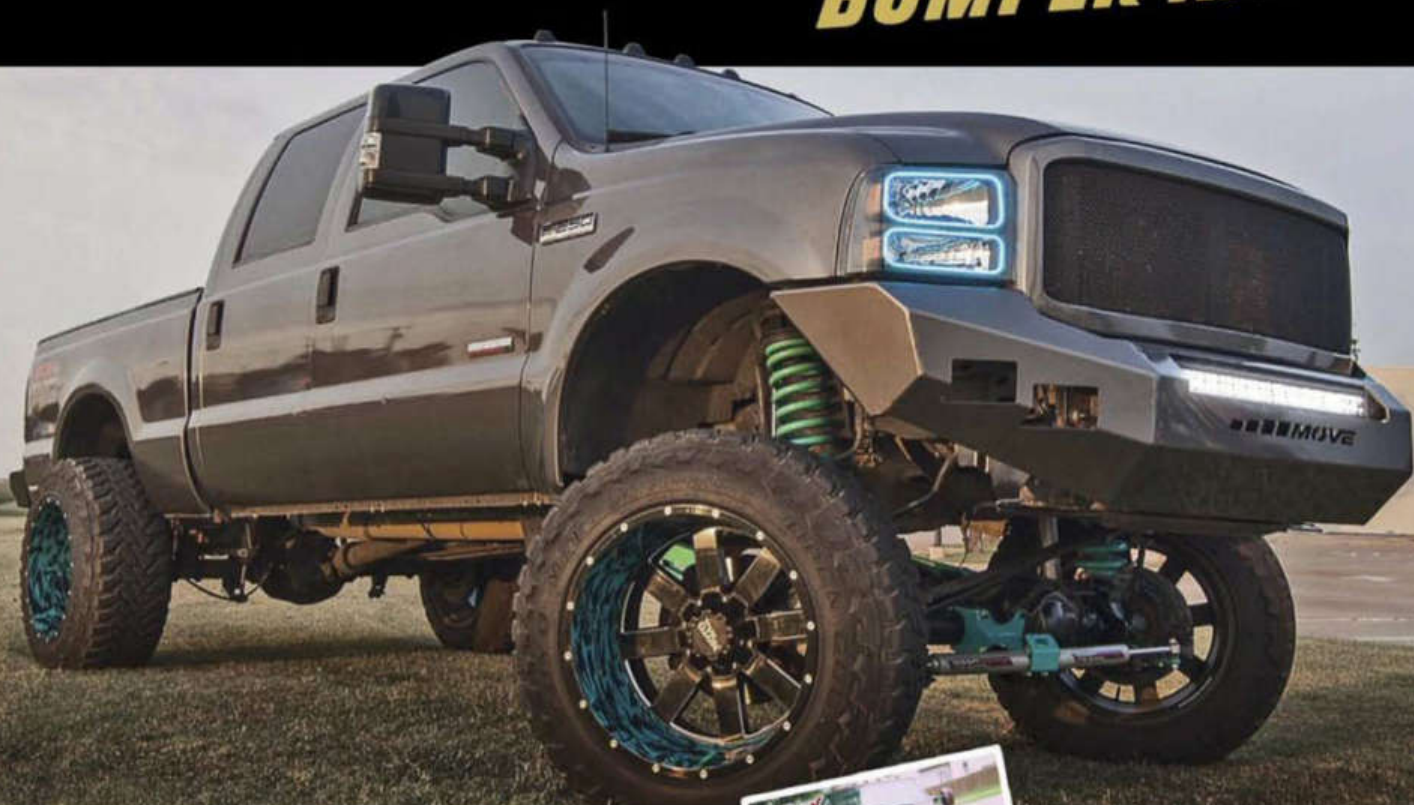
We love diesels here too, and thanks for your comments about our magazine. What follows has appeared here before, but remains solid advice for 6.5 owners. We know that performance, engine cooling, economy and drive-ability are all important to all diesel owners, including us.

Power and cooling are two watchwords on the minds of many 6.5L diesel owners who use their rig to tow. There is hope. The following list of suggestions should be performed in the order in which they appear, and which begin with least-cost to more expensive.

Always concentrate on cooling first, power second. So, begin by

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removing the top half of the radiator fan shroud, and then remove any bugs, leaves or other debris that could interfere with airflow through the ATF/engine oil coolers, the A/C condenser and the radiator. Be careful using hi-pressure washers. When used incorrectly, pressure washers can flatten the cooling fins in the various coolers and radiator and make the problem much worse.

You mentioned installing a new viscous

fan-clutch. Aside from your local GM dealer, there is a variety of fan-clutches available from a smorgasbord of 6.5L diesel vendors. Most are original equipment replacements, which unfortunately come with a fairly wide engage temperature calibration. It's important that your fan-clutch engages before the engine temperature exceeds 210 degrees. An engaged fan-clutch is unmistakable because of the increased roar produced by the fan. If

you're not hearing the fan engage by 210, you'll continue to have overheating problems no matter what you do or how much money you spend on aftermarket parts. A clean radiator and properly engaging fan-clutch usually solve most cooling problems. Conversely, an improperly calibrated or inoperative fan-clutch is the single biggest cause of 6.5 overheating. Discussing fan-clutch engagement with your vendor and letting him know what you expect for engage temperature can help you get the cooling performance you're looking for. Don't spend another dime or install any further upgrades until you've got the fan-clutch engaging when it should. It's that important.

Your current fan is 20" in diameter. You can gain fan performance by upgrading to the same fan used by the 2001-2004 LB7 Duramax 6600. The LB7 uses a lightweight 9-blade 21" diameter composite fan that is a direct bolt-on for the 1997-98 model year 6.5 fan-clutch. Most 6.5 owners don't need to trim the fan shroud to fit the larger fan, but if you do, simply remove a portion of the inside lip of the shroud using a jig saw. The highly efficient Duramax fan (pn-15010202) is a tremendous bargain at about \$40 and will increase the airflow through the radiator. Unfortunately, if you have a 1996 model year fan-clutch, the bolt pattern won't fit the Duramax fan. Those who replace or upgrade their fan-clutch should buy one produced for the 1997-98 model year and install the Duramax fan at the same time.

Now, assuming the overheating problem has improved, you can begin preparing for a power increase. To begin, you'll need three gauges: a 0-15 psi boost pressure gauge, an exhaust temperature gauge (EGT) and a transmission temperature gauge. These are usually installed in an A-pillar gauge pod. The boost pressure gauge helps you evaluate turbo performance; the EGT gauge helps you protect the engine from excessive exhaust temperatures, and the transmission temperature gauge helps you identify any transmission temperature problems. Those who tow with the 4L80-E automatic transmission frequently report high ATF temperatures.

Next, install a performance oriented 3-1/2" mandrel-bent exhaust system that includes a free-flowing muffler. Explain to your exhaust system vendor what you and your family expect for exhaust noise. There are very many



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different styles and types of mufflers available for these diesels. A family-oriented Suburban usually requires a little (or a lot) quieter system than a pickup truck might.

The next step would involve a powertrain control module (PCM computer) upgrade to increase power. BD-Power.com offers most of the items discussed here, and they can supply you with an exchange PCM. Ask for a towing or "RV" program.

The sky is the limit from here on. You can install an intercooler, aftermarket turbo-charger, higher level computer programming, and internal engine modifications, which could include lower compression ratio pistons, Fluidampr harmonic damper, gear-drive timing set, and on and on. Those who go the high-dollar route usually end up with a truck or Suburban that can tow with most stock diesel pickups produced in the early 2000s and do it without overheating.

Monitoring Fuel Economy

I own a 2001 3/4 ton 24-valve Dodge diesel with about 110,000 miles on it that I use to tow a horse trailer. Typical trailer weight is approximately 5,000 pounds. The truck has the 4-speed automatic transmission with overdrive. Some thousands of miles ago, my non-towing fuel mileage dropped from 21-22 mpg to 18, and my towing fuel mileage dropped from 12.5 to just 10. No problems were detected by the dealer techs. I service the fuel filter, and the engine oil/filter every 5,000 miles, and the truck runs perfectly fine otherwise. And the fuel injection pump was replaced at around 80,000 miles. The current fuel economy really bothers me, and I was hoping you might have some suggestions to improve the situation.

Helen Sande
Via the Internet

Ms. Sande,

A fuel economy of 10-12 mpg while towing and 18-20 non-towing isn't terribly bad. But, if you don't already have one, I recommend installing a fuel pressure monitor, which monitors the fuel pressure supplied by the electric fuel lift pump. The kit includes a small red dash-mounted LED light that illuminates

when the fuel lift pump isn't delivering the correct fuel pressure. The Bosch VP-44 fuel injection pump is sensitive to a loss of fuel inlet pressure. A loss of inlet pressure can affect the life of the injection pump and can produce a variety of drive-ability problems, including a loss in fuel economy. The folks at BD (BD-Power.com) and/or U.S. Diesel Parts (USDieselParts.com) both offer a fuel pressure monitor kit. Good luck. **DW**

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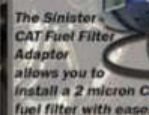
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